

**COMPLETION REPORT FOR PROBE HOLE C3832 (TX-104)  
TX TANK FARM 200 WEST AREA**

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Prepared for the Office of River Protection, CH2M HILL Hanford Group, Inc.  
Richland, Washington

## CONTENTS

1.0 INTRODUCTION .....	1
2.0 SUMMARY OF ACTIVITIES.....	5
3.0 DRILLING AND SAMPLING DETAILS .....	6
3.1 DRILLING .....	6
3.1.1 Casing Driving.....	7
3.1.2 Split-Spoon Sampler.....	9
3.2 SAMPLING .....	9
3.2.1 Soil Sampling .....	9
3.3 GEOPHYSICAL LOGGING .....	11
4.0 PROBE HOLE DECOMMISSIONING .....	12
5.0 ENVIRONMENTAL, SAFETY, AND HEALTH .....	12
6.0 REFERENCES .....	13

## APPENDICES

A Field Activity Reports.....	A-i
B Geologic/Sample Logs .....	B-i
C Geophysical Logs .....	C-i
D Chain of Custody/Sample Analysis Requests .....	D-i
E Field Documentation .....	E-i
F Field Logbook Entries .....	F-i
G Equipment Cleaning Forms .....	G-i
H Washington State Department of Ecology Documentation .....	H-i
I Health and Safety Monitoring .....	I-i

## LIST OF FIGURES AND PLATE

Figure 1. Location of 241-TX Tank Farm. ....	3
Figure 2. Location of C3832 and Other 241-TX Tank Farm Wells, Probes, and Tanks. ....	4
Figure 3. C3832 Blow Counts—Depth vs. Blow. ....	8
Plate 1. TX-104 Probe Hole C3832 .....	following page 13

## LIST OF TABLES

Table 1. Sample Depths. ....	10
Table 2. Dry Wells Utilized for Cross-Section Correlation.....	11

## **TERMS**

BGS	below ground surface
cm	centimeter
cps	counts per second
DOE	U.S. Department of Energy
ft	foot
ft•lb	foot-pound
in.	inch
pCi/g	picocuries per gram

## **COMPLETION REPORT FOR PROBE HOLE C3832 (TX-104) TX TANK FARM 200 WEST AREA**

### **1.0 INTRODUCTION**

The U.S. Department of Energy (DOE) assigned the River Protection Project Single-Shell Tank Program the tasks of transferring waste from the single-shell tanks to double-shell tanks and developing and implementing a strategy to retrieve single-shell tank and miscellaneous underground storage tank waste. In support of the eventual retrieval of this waste, the Single-Shell Tank Program Vadose Zone Project was given responsibility for collecting and providing subsurface data from the single-shell tank farm facilities. This data is intended to provide an understanding of the distribution and movement of contaminants in the vadose zone under and adjacent to the tank farms. Subsequently, a work plan was prepared to collect field characterization data in and near Waste Management Area TX. This planned activity is intended to support decision-making relative to DOE/RL-99-36, *Phase 1 RCRA Facility Investigation/Corrective Measures Study Work Plan for Single-Shell Tank Waste Management Areas*. The document, RPP-7578, *Site-Specific SST Phase 1 RFI/CMS Work Plan Addendum for WMAs T and TX-TY*, was necessary to identify and plan characterization efforts as part of DOE/RL-99-36.

The data requirement goals identified through a data quality objective process are documented in RPP-7578. The outlined goals include the tasks, project responsibilities, and schedules for the characterization efforts. One of the identified field characterization efforts is the collection of vadose zone data from the installation of up to four closed-end probe holes in the TX tank farm.

Utilizing RPP-7578 as guidance, DFSNW-DOW-006, *Description of Work: Drilling and Sampling* was prepared defining the methodology and actions for drilling and sampling a series of probe holes in the TX tank farm. This report provides information for the planned series of probe driving activities. DFSNW-DOW-006 included selected sampling depths, borehole construction and sampling methodologies, geophysical logging requirements, decommissioning directions, environmental health and safety program directions and quality control drivers. This borehole completion report is a summary of activities and sampling efforts for the placement of probe hole C3832 adjacent to tank TX-104, the first in the series planned under DFSNW-DOW-006. See Figure 1 for a location map of the 241-TX tank farm and Figure 2 for a detailed location map of C3832 and other wells, probe locations, and tanks in the project area. Appendices to this completion report contain copies of the following documentation generated during performance of the outlined work:

- Field activity reports (Appendix A)
- Geologic/Sample logs (Appendix B)



- Geophysical logs (Appendix C)
  - Moisture logs gathered from 14 dry wells in the TX tank farm
  - High-Purity Germanium (HPGe) and moisture logs from probe hole C3832
  - February 26, 2002, letter and attachments from Pacific Northwest Geophysics to James Meisner and March 5, 2002, letter and attachments from Pacific Northwest Geophysics to Kent Reynolds.
- Chain of Custody/Sample Analysis Requests (Appendix D [includes summary sheets])
- Blow count forms (Appendix E)
  - Casing driving
- Field logbook entries (Appendix F)
- Equipment cleaning forms (Appendix G)
- Washington State Department of Ecology (Ecology) documentation (Appendix H)
  - Start and decommissioning cards
  - Completion report with Final As-Built.

Figure 1. Location of 241-TX Tank Farm.

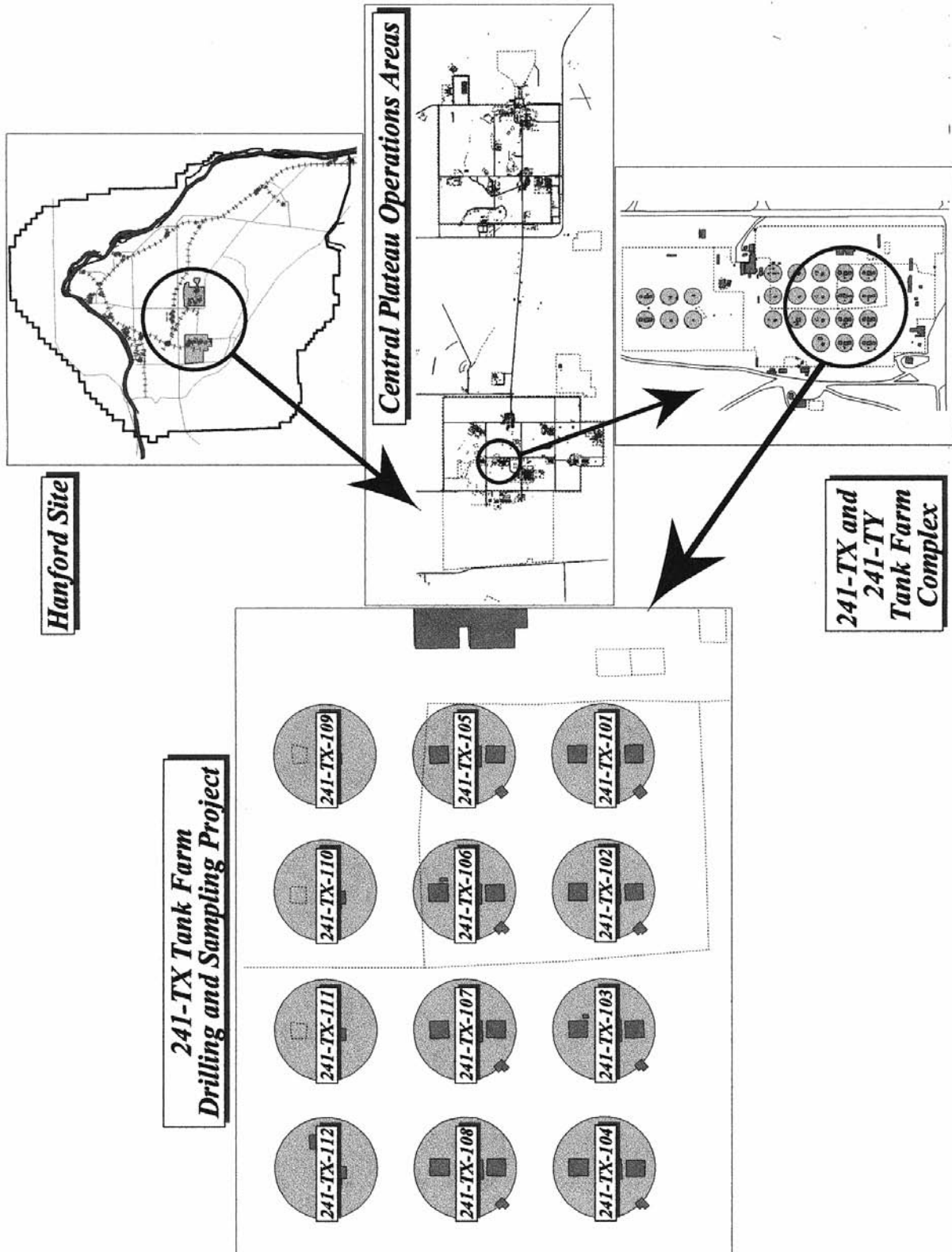
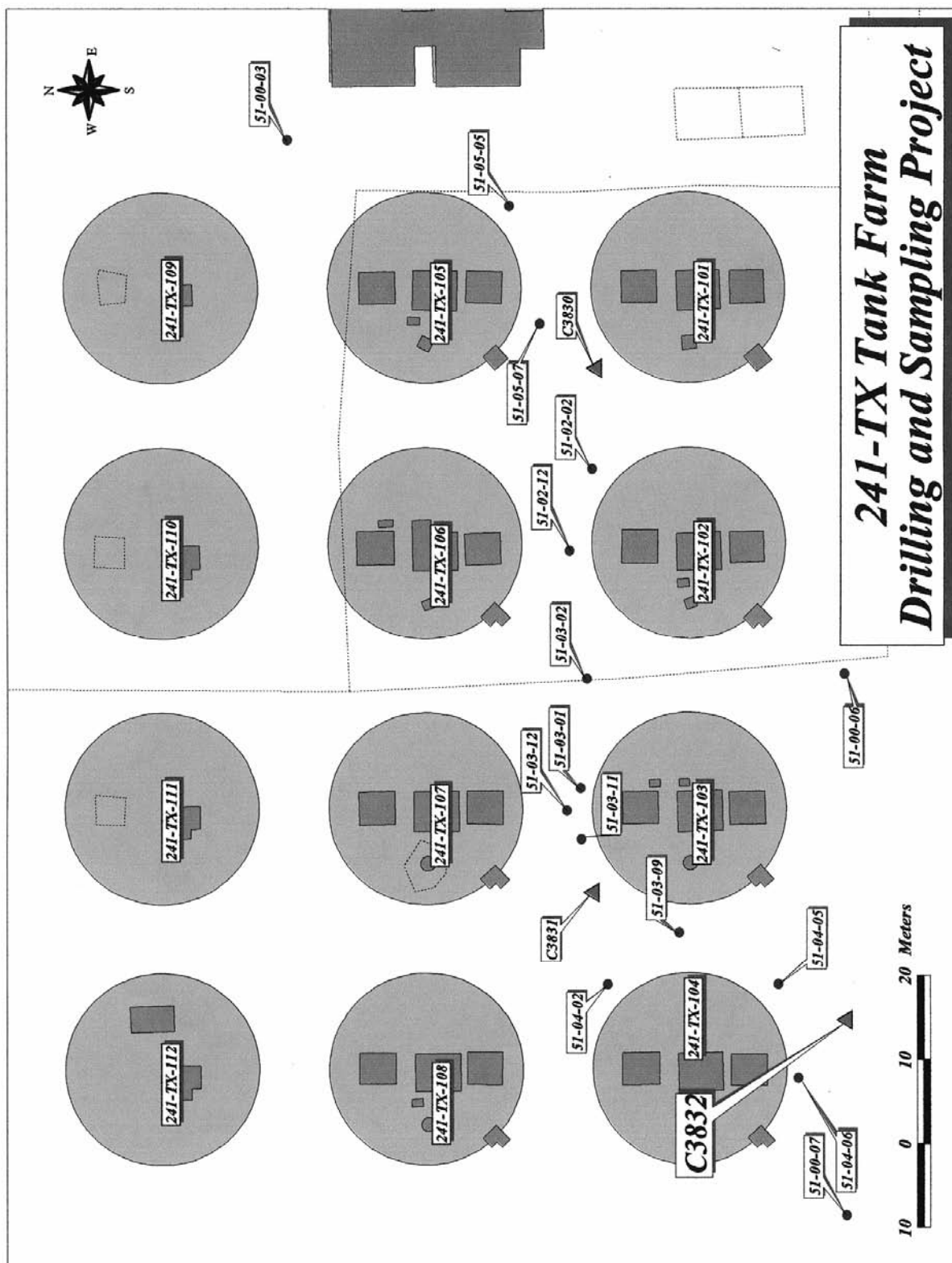


Figure 2. Location of C3832 and Other 241-TX Tank Farm Wells, Probes, and Tanks.



## 2.0 SUMMARY OF ACTIVITIES

Duratek Federal Services, Inc., Northwest Operations (DFSNW) began preliminary design and procurement planning for samplers, casing jacks and wrenches in support of the TX scope of work in late January 2002. This was followed by procurement of the necessary field equipment and support (drill pipe, casing, casing tips and shoes, samplers, casing and drill pipe wrenches, casing jacks and contracting for drilling support) in February and March. Fifteen dry wells in the vicinity of the planned probes were selected for moisture logging and 14 of the selected wells were logged and analyzed by late February 2002. Concurrent with equipment procurement and moisture logging and analysis, DFSNW-DOW-006 was prepared and submitted. The purpose of DFSNW-DOW-006 is to guide field activities, call out selected sample depths and provide documentation of planned activities to tank farm operations.

Field activities relating to C3832 (the first of the three planned probes) commenced with staging of the probe-driving equipment to the 200 West Area for radiological survey on April 29, 2002. Staging of support equipment and setup of the probe driving system on location began on April 30 and concluded with mobilization of the equipment from TX-104 (C3832) to the TX-107 probe site (C3831) on June 28, 2002. Field Activity Reports were generated by DFSNW field oversight personnel for each day of the deployment and copies are included in Appendix A. Excluding weekends and holidays there were 39 field days associated with mobilization, drilling, sampling, logging, decommissioning, and de-mobilization related to probe hole C3832 adjacent to TX-104. The total days on location included four days of rig-up and rig-down activities, two days for borehole decommissioning, three days of geophysical logging, and 18 days of driving casing and sampling. The remaining time onsite was stand-by days due to adverse weather, rig repairs and work delays caused by tank farm documentation problems. The total sampled depth of 115.89 ft below ground surface (BGS), as measured by steel line tape, was reached on June 3, 2002. At this depth the probe casing was at a total of 114.29 ft BGS, at refusal, and was approximately 2.3 ft into the highly cemented portion of the calcium carbonates of the Cold Creek sediments. Blow counts exceeded manufacture's recommended numbers per advance depth at this point. Prior to decommissioning, geophysical logging was completed to total depth with moisture and HPGe spectral gamma detectors. Decommissioning of the borehole commenced on June 12, 2002, and was completed on June 13.

Nineteen (19) split-spoon samples, 1.25 ft long x 2.5 in. in diameter, were collected at specified depths for potential chemical and radiological analysis during the drilling/driving of this probe. (See Appendix D for information regarding sample depth, Chain of Custody, etc. and Appendix B for geologic descriptions of the samples retrieved). One zone (sample number S02046-05 collected from 44.14 ft to 45.54 ft BGS) displayed indications of excess or free water after sampling. When the sampler was removed from the borehole, water was observed dripping from the bottom shoe of the sampler and free water had been forced from the vent hole at the top of the sampler liner chamber. Before the hole was advanced beyond this depth, driving activities were placed on stand-by and the probe hole was monitored approximately two hours for accumulation of free water by use of e-tape measurements (no free or standing water was observed). Sampling results are discussed further in Section 3.2.1.

Only one sample collected had any radiological contamination detected by field instrumentation. Sample SA02046-13 collected from 82.99 ft to 84.34 ft BGS had Geiger-Muller count rates in the 250-300 counts per second (cps) range when compared to an average of 200–250 cps as a background level in the TX farm. The elevated count rates on field instruments correlates to the area of highest levels of Cobalt-60 contamination identified by HPGe spectral logging for the C3832 probe hole. HPGe spectral logging identified  $^{137}\text{Cs}$  above background levels from surface to approximately 1.5 ft BGS with a peak of 0.5 pCi/g at 0.5 ft and  $^{60}\text{Co}$  detections from approximately 75 ft BGS to the total depth of the probe advance. At 79.5 ft BGS spectral analysis indicates 1.2 pCi/g of  $^{60}\text{Co}$  (highest rates analyzed) and up to 15 pCi/g of  $^{238}\text{U}$  at 109 ft BGS. See Appendix C for borehole geophysical analysis results.

The position of this boring was initially located by CH2M HILL Hanford Group, Inc. DFSNW personnel subsequently documented the location at Easting 566717.68 m, Northing 136137.32 m at an elevation above sea level of 206.22 m (676.57 ft) by use of Global Positioning Satellite instrumentation.

### 3.0 DRILLING AND SAMPLING DETAILS

#### 3.1 DRILLING

Per the referenced description of work (DFSNW-DOW-006), the casing utilized was a design configuration proven at the SX-108 Slant Borehole Project; e.g., P-110 carbon steel, 18 cm (7-in.) OD x 13 cm (5-13/16-in.) ID with a pin pile thread. Details of the design configuration and methodology are discussed in RPP-6917, *SX-108 Slant Borehole Completion Report*. The majority of the casing string was composed of 5-ft joints with several 2-, 3- and 4-ft joints for positioning the probe end at proposed sampling intervals. Based on engineering calculations, prior testing and previous success at SX-108, the thread pattern was selected to withstand the expected driving force as well as the maximum pull back capacity of the selected casing jacks. The drilling rig was equipped with an ICE-40 pile driver, which delivers approximately 40,000 ft•lb of force in the vertical position. The rig, pile driver and remote handling arm configuration were successfully utilized previously for the SX-108 Slant Borehole project. The pile driver provided adequate force to drive the casing to a total depth of 114 ft BGS. At approximately 112 ft BGS the highly cemented facies of the Cold Creek sediments were encountered. Blow counts indicated refusal and only another 2.29 ft of further casing advance was possible. On initial driving the casing was observed to be off vertical by approximately 1½ to 2 degrees in a northwesterly direction (e.g., tip angled away from TX-104 tank). DFSNW personnel investigated the problem and determined that the rig and casing were not in proper alignment upon initiation of probe driving and correction for the minor deviation was not attempted. Given the observed angle of deviation, calculations indicated that at total depth the probe tip was approximately 3 ft to 3.5 ft off-center to the south-southeast from the surface entry point. To ensure proper angle of penetration, proper alignment and rig stabilization are essential at the initiation of driving because this method does not currently allow for adjustments to drive direction, once started. Lessons learned from this effort will be applied by using engineered

changes to driving support equipment and additional personnel training prior to initiation of driving activities on the next probe hole of the series.

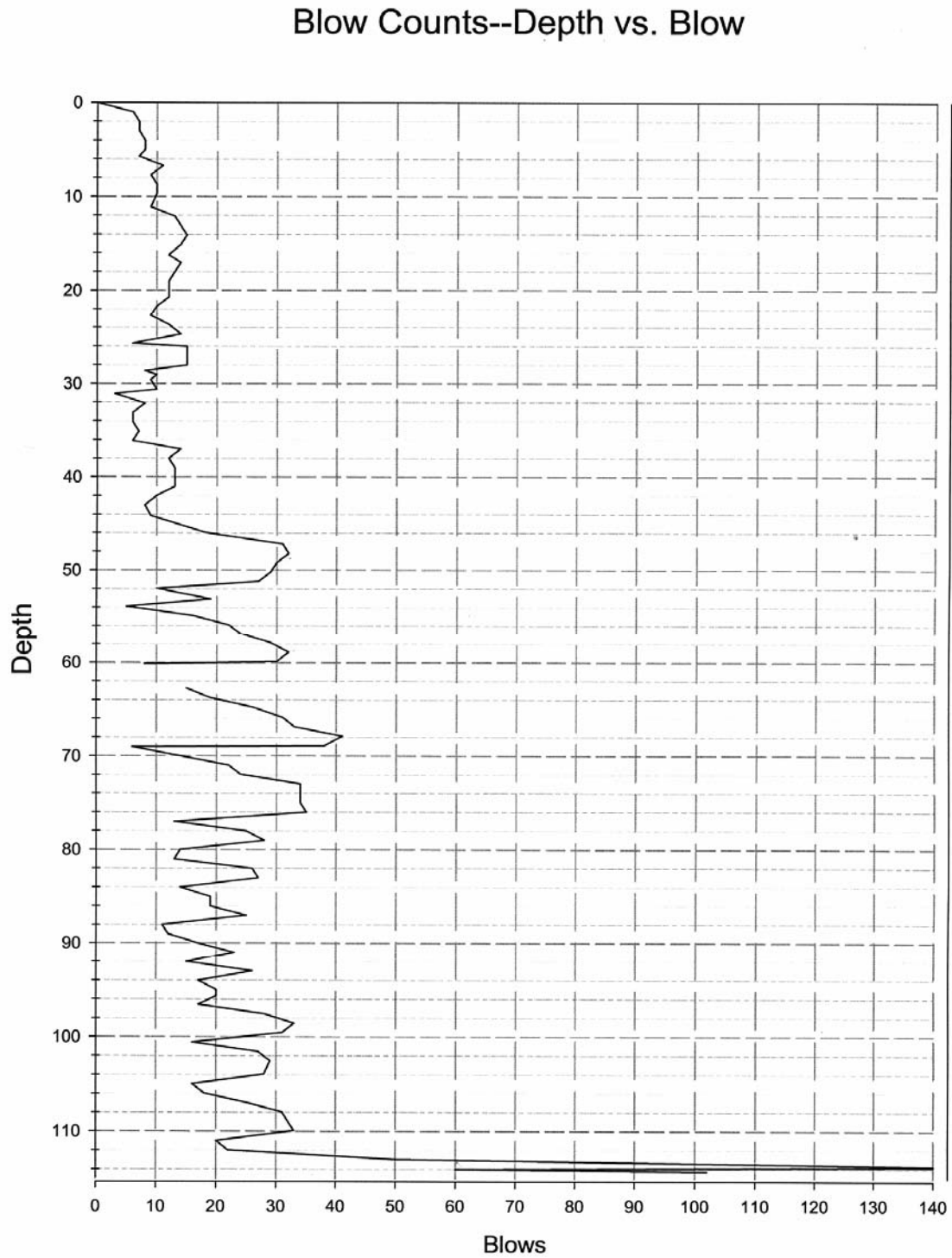
No problems with handling or making up the casing were encountered. Some minor problems with operation and maintenance of the wrench breakout and jack system were encountered, which affected crew efficiencies. These problems are being addressed with ongoing modifications to wrench slip designs, wrench tolerance adjustments, and modifications to back-pulling slip and bowl designs and tolerances. It is expected that these changes will increase crew efficiencies and reduce rod trip times and handling issues. The casing was made up to manufacturer's torque specifications (5,000 ft•lb). Following removal of the casing from the borehole, the entire casing string was visually inspected. No damage to the casing, casing threads or tip and shoe was observed.

### 3.1.1 Casing Driving

To accomplish the objectives of acquiring samples the casing was driven in a closed configuration (e.g., removable tip in place) to the planned sample depths, and the tip and inner rod were then removed. A sampler was placed on the rods, inserted through the casing to total depth and the pile driver was utilized to drive the sampler ahead. Casing refusal is defined in the manual used by ICE operators. Refusal has been met when less than one inch of advance is gained for 10 full stroke blows of the hammer.

Blow counts vs. advancement of the casing were recorded and, as expected, varied over depth. Field records (blow counts recorded during driving of the casing to total depth) and Table E-1 of the blow counts recorded per length of casing advance are provided in Appendix E. Tracking and comparison of blow counts when utilizing this type of pile driver for engineering purposes is complicated by the fact that the hammer reacts to the resistance of the probe to advance. When little resistance is encountered, the hammer does not stroke to its full length and less than the maximum 40,000 ft•lb is applied at that point. When resistance to the advance of the probe increases, full hammer strokes occur and the full potential force of the hammer is used to advance the casing. Figure 3 is a graphic representation of the blow count vs. depth for C3832. At a depth (casing length) of 111.9 ft to 112.9 ft BGS the blow count increased from an average of 20-30 blows per foot to 50 blows per foot. This increased resistance to driving was interpreted as being the contact of the calcium carbonate rich facies of the Cold Creek with the overlying laminated silt facies of the Cold Creek. Subsequent sample examination places the contact between the two facies at 110.6 ft BGS. Casing refusal (blow counts in excess of 120 blows per foot) occurred at 113.77 ft. Attempts to open the hole and enable casing advance by sampling ahead of the probe and thus easing of sediment resistance failed. A sampler was advanced to a total depth of 115.89 ft, but casing advance beyond 114.24 ft was not achieved.

Figure 3. C3832 Blow Counts—Depth vs. Blow.



### **3.1.2 Split-Spoon Sampler**

A split-spoon sampler with an additional inner steel liner for increased structural strength was specially designed for collecting sediment samples ahead of the driven casing. This sampler collects a 2.5-in. x 1-ft driven sample. The sampler body is designed to house the split liner and the sample liners. For this scope of work a sampler utilized in the SX-108 Project was redesigned to accommodate larger liners (2.5-in. vs. 2-in.) through removal of the lead shielding utilized for the previous deployment. Removing the shielding and increasing sample size were undertaken because of the lower expected contamination levels when compared to the previous deployment. This lower expected level of radioactive contamination allowed larger volumes of soil with less shielding to be safely handled at the surface in the field and at the laboratory. The sampler is deployed and advanced by use of an inner string of 4½-in. drill pipe.

Sample handling and any potential contaminate spread, as well as potential exposure of onsite personnel were minimized by capping the bottom of the split-spoon sampler, placing it in a transport container and using the remote-handling arm. The complete split-spoon assembly was placed in a transport drum and transported to Pacific Northwest National Laboratory with the sample intact in the split spoon. The laboratory performed the breakout of the samples from the split spoon and extruded the soil from the liners. No onsite breakdown of the samples was performed.

## **3.2 SAMPLING**

### **3.2.1 Soil Sampling**

During advancement of the borehole, sampling was attempted 19 times using a split-spoon sampler. The split spoon was driven by casing hammer a minimum of 1.25 ft into the bottom of the borehole at each selected sample location. The exact control of the driving distance for each sample has been proven to be problematic. Attempts have been made to restrict these distances to no more than 1.4 ft; however, due to the force produced by the casing hammer utilized to drive the sampler and the unknown properties of the sediments that are being sampled, this number was exceeded by as much as four tenths of a foot on at least one occasion and two to three tenths on several occasions. Overdriving of the sampler results in highly compacted materials in the sampler and causes difficulties for removal. Over compaction of samples alters physical properties of some portions of the sample by destroying sedimentary structures and porosity and rendering those portions of the sample unsuitable for density analysis. Chemical and radiologic analysis is not affected by the over compaction.

Projected target depths for sample collection were first outlined in the referenced RFI/CMS documentation (RPP-7578) prepared by CH2M HILL. Further refinement of the preferred sample depths was derived by performing moisture logging in 14 dry wells surrounding all of the proposed probe locations in the TX Farm. To accomplish the target refinement, cross section correlations of observable and identifiable geologic features were prepared from the logging data. These features were compared to the sample depths identified in the RFI/CMS (RPP-7578)



and with the approval of the CH2M HILL Project Lead, sampling targets based on projected geologic features (e.g., facies contacts, grain size changes, features such as tank excavation compaction zones) were selected and documented in DFSNW-DOW-006. Table 1 below provides information on targeted sample depths, actual sample depths, generalized geophysical log detections and sediment types for the interval and recovery percentages.

Table 1. Sample Depths.

Targeted from Moisture Log Review Sample #/Depth in feet	TX-104 (C3832)	Log Detections/sediment	Recovery
1) 15-16	16.21-17.61	moisture increase/backfill	100%
2) 28-29	28.09-29.49	moisture change/backfill	100%
3) 37-38	36.09-37.49	moisture decrease/backfill	100%
4) 44-45	44.14-45.54	moisture peak/backfill	100%
5) 52-53	51.18-52.58	moisture change/f sand (H)	100%
6) 53-54	53.08-54.43	moisture decrease/sand (H)	100%
7) 61-62	60.12-61.52	moisture (m) inc./med snd (H)	100%
8) 62-63	61.76-63.36	m peak-dec/silt-snd (H)	100%
9) 69-70	69.01-70.31	m peak/f-med sand-silt	100%
10) 76-77	75.99-77.39	Co-60-m peak/f-m sand-lam silt	100%
11) 79-80	78.29-80.31	Co60-dec m/lam silt-to c-m sand	100%
12) 83-84	82.99-84.34	Co60-inc m/m-c snd to vf snd-silt	100%
13) 87-88	86.99-88.41	dec Co60-dec m/m-c snd	100%
14) 93-94	92.99-94.4	Co60-dec m/m-c-vc snd	100%
15) 96-97	95.64-97.04	Co60-inc m/m-c snd	100%
16) 104-105	103.94-105.36	inc Co60-inc m/lam silt-vf snd	100%
17) 110-111	109.91-111.38	dec Co60-inc m,U238/pbl snd-cemt CaCO <sub>3</sub>	100%
18) 114-115	113.77-115.2	dec Co60-dec m/cemt CaCO <sub>3</sub>	100%
Unplanned	114.47-115.89	Co60-dec m/cemt CaCO <sub>3</sub>	100%
	Refusal		
19) 121-122			
20) 126-127			
21) 134-135			
22) 147-148			

Of the nineteen samples collected all 38 six-inch liners were 100% full on recovery. Because of the overdriving during several sampling events, the materials in the shoe and lower portion of the bottom liner were compacted, and thus were not appropriate for any laboratory-derived density studies. At the time of this report no detailed information relating to laboratory-derived soil moisture content, sample radiochemistry or chemical contamination is available. As related in the summary section, several samples were taken in zones that had notable physical and/or geophysical characteristics. Sample S02046-05 collected from 44.14 ft to 45.54 ft BGS displayed indications of excess or free water after sampling. Subsequent moisture logging indicated that the particular zone had between 12 and 13% volume moisture content, and when the sample was removed from the liner in the laboratory the sediments were described as very moist. The sediments were interpreted to be fine sands and silt from a compacted zone at the bottom of the tank excavation. Observation of the probe hole after sampling did not indicate that water content was at saturation levels for the interval, and as noted above neutron-moisture logging supported that information.

Field instrumentation detected elevated count rates in just one sample, SA02046-13 that was collected from 82.99 to 84.34 ft. BGS. The Geiger-Muller count rates were in a 250–300 cps range compared to an average of 200–250 cps as a background level in the TX farm. The elevated count rates on field instruments and subsequent HPGe logging have been identified as  $^{60}\text{Co}$  contamination, and the high detections occurred at a grain size change in the sediments. In the sample interval a medium-to-coarse sand is in sharp contact with an underlying silt. Descriptions of the sediments retrieved in the 19 samples are found in Appendix B and Plate 1 (a graphic depiction of the geophysics, expected lithologies and retrieved samples with sample descriptions and formation contact depths).

### 3.3 GEOPHYSICAL LOGGING

Prior to the initiation of probe driving activities, open dry wells in the vicinity of the probe locations were reviewed for accessibility. Fifteen wells were selected for potential logging. See Figure 2 for the location of the wells selected (marked with tank farm well numbers, for example 51-04-05). Fourteen of the wells were subsequently logged by DFSNW with neutron-moisture instrumentation developed specifically for use at Hanford by DFSNW and analyzed for percent volume moisture content. Results of this logging scope (log plots, log data reports and analysis reports) are contained in Appendix C. Correlation cross-sections utilizing these logs were generated to select sample depths for the probe locations. Table 2 below lists the dry wells utilized for cross section correlation. Figure C-1 in Appendix C is a compiled cross section of the 14 logs acquired. Inspection of the moisture logging results revealed four wells (51-03-01, 51-03-11, 51-04-02 and 51-04-06) with anomalous readings in the 0 ft to 35 ft BGS zones of the boreholes. The moisture and spectral logging data from these four borings, as well as available construction information records, were reviewed to provide guidance in interpretation of the observed phenomena. The observed apparent moisture peaks are interpreted to be the result of cement grout introduced into the annular area of the boring during final completion of the wells. (See March 5, 2002, letter and attachments from Pacific Northwest Geophysics to Kent Reynolds in Appendix C for details.)

Table 2. Dry Wells Utilized for Cross-Section Correlation.

1. 51-00-07	8. 51-03-01
2. 51-04-06	9. 51-03-02
3. 51-04-05	10. 51-00-06
4. 51-03-09	11. 51-02-02
5. 51-04-02	12. 51-05-07
6. 51-03-11	13. 51-05-05
7. 51-03-12	14. 51-00-03

When C3832 probe reached refusal (total depth) the inner drill string and tip were removed and geophysical logging was conducted utilizing DFSNW equipment and personnel prior to decommissioning of the probe hole. Appendix C contains copies of the log plots, log data reports, analysis results, and interpretations generated from the probe hole (See log plots for C3832 in Appendix C). The following logging suites were utilized:

1. Gross gamma
2. Spectral (HPgE) gamma logging
3. Neutron-Moisture.

Analysis of the HPGe data detected  $^{137}\text{Cs}$  within the top 1.15 ft of the probe hole and  $^{60}\text{Co}$  as well as  $^{238}\text{U}$  below tank bottom levels. Cobalt detections began at approximately 76 ft BGS and continued to the total depth of probe advance. The highest concentration level of cobalt detected (1.2 pCi/g) occurred at 79.5 ft BGS and minor amounts were detected at up to .6 pCi/g at 92 ft and 106 ft BGS. Because of their interbedded silt and sand lithology, samples collected at 75.9 ft to 77.4 ft BGS and 78.3 ft to 80.3 ft BGS may contain useful information relating to soil adsorption potentials. Uranium-238 detections began at approximately 102 ft BGS and a peak concentration of 15 pCi/g was recorded at 106 ft BGS. A sample collected at 103.9 ft to 105.4 ft BGS was comprised of fine-to-very-fine sand and silt and is interpreted to be part of the Cold Creek silt sediments.

#### **4.0 PROBE HOLE DECOMMISSIONING**

Decommissioning of probe hole C3832 commenced on June 12, 2002, and was completed on June 13, 2002. Decommissioning activities met all applicable sections of WAC 173-160, “Minimum Standards for Construction and Maintenance of Wells,” requirements. As the casing was extracted, dry bentonite materials were added to fill the annular space. Thirty nine (39) ft<sup>3</sup> of materials (55.5 sacks) were placed into the probe hole as the casing was extracted. This volume slightly exceeds the minimal calculated volume (37.1 ft<sup>3</sup>) for filling the void space created by casing extraction. The probe hole was filled within approximately 1 ft of grade and covered with gravel to conform to tank farm requirements.

#### **5.0 ENVIRONMENTAL, SAFETY, AND HEALTH**

During the field operations, the job site was surveyed by both DFSNW Operations Safety and CH2M HILL Hanford Group, Inc., Tank Farm Industrial Hygiene and Safety personnel for safety and health compliance. To ensure compliance with hearing protection guidelines, noise levels were monitored during the probe driving operations. (See Appendix I for data relating to field monitoring and a subsequent transmittal letter to CH2M Hill Hanford Group, Inc., documenting the monitoring and results.) There were no lost time or reportable *Occupational*

*Safety and Health Act of 1970* injuries during performance of the work activities relating to this scope of work. One first aid case was reported during completion of the scope of work. A sub-contract worker onsite pinched a finger when rolling casing on the pipe racks and was transported to the 200 West First Aid Station. The injury was examined and the worker returned to work with no restrictions.

## 6.0 REFERENCES

DFSNW-DOW-006, 2002, *Description of Work: Drilling and Sampling*, Rev. 0, Duratek Federal Services, Inc., Northwest Operations, Richland, Washington.

DOE/RL-99-36, 1999, *Phase I RCRA Facility Investigation/Corrective Measures Study Work Plan for Single-Shell Tank Waste Management Areas*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

*Occupational Safety and Health Act of 1970*, 29 USC 651 et seq.

RPP-6917, 2000, *SX-108 Slant Borehole Completion Report*, Rev. 0, prepared by Waste Management Technical Services for CH2M HILL Hanford Group, Inc., Single Shell Tank Farms Vadose Zone Program, Richland, Washington.

RPP-7578, 2001, *Site-Specific SST Phase I RFI/CMS Work Plan Addendum for WMAs T and TX-TY*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," *Washington Administrative Code*, as amended.

**APPENDIX A**  
**FIELD ACTIVITY REPORTS**

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## Page 1 of 1

END: 0.0 ft

K. Reynolds/K. Flower

SIGNATURE: *M. C. Gardner*

## Page 1 of 1


K. Reynolds/K. Flower


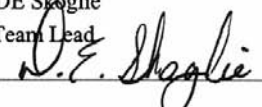
SIGNATURE: *M. C. Anderson*



## Page 1 of 1

REPORT BY: DE Skooglie TITLE: Field Team Lead SIGNATURE: <i>David E. Skooglie</i>	REVIEWED BY: MG Gardner TITLE: Project Manager DATE: 8-13-02 SIGNATURE: <i>MG Gardner</i>
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		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 04		DATE: May 02, 2002 Thursday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Pre-Job Safety meeting and initiate drilling; realignment of drill. Equipment blank S02046-01				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 6.81 ft.		
CONSTRUCTION DESCRIPTION:						BORING DEPTH: START: 0.0 ft  END: 6.81 ft  START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0 " OD	NA	CS	Shoe, 7.5 " OD	0.0 ft	6.81 ft	
DOCUMENTED DOWN TIME			LOG SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson H Sydnor Sharp (Optr) K Hartelius (HPT) R. Steffler/K. Young/F. Hall K. Reynolds/K. Flower
N/A			Bottom of 7 " OD casing (start of shift) = 0.0 ft			
			Bottom of 7 " OD casing (end of shift) = 6.81 ft			
			Casing (7 in OD) stick up (end of shift) = 0.11 ft			
			Ground to top of work deck = 3.5 ft			
WEATHER CONDITIONS (373-2716)			Total casing = 10.42 ft			
10:30 hrs: SE 6 mph, gusts 11 mph; .67 F; humidity 40 %; barometric pressure 29.02; forecast ~2pm gusts 30-40 mph.			SAMPLE SUMMARY			
			Equipment blank sample (S02046-01) @ 12:05.			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	08:00	Equipment daily inspection was completed. A hydraulic end cap was rotated 90 degrees to allow the floating head to move without rubbing the hydraulic components.				
08:00	10:00	Tank Farm Technical Safety Evaluation (TSE) is being conducted on the work package. Drilling cannot be started until the TSE is approved. The hammer was set-up and the curtain was placed around the jacks.				
10:00	10:35	An early lunch was taken. The TSE may be ready after lunch.				
10:35	11:53	The TSE was approved and work can start. A pre-job briefing was held. This initial pre-job will be considered the weekly safety meeting.				
11:53	12:10	Personnel who had not taken deck training previously are currently conducting deck training. An equipment blank was taken by Young and Hall.				
12:10	12:18	The hammer was primed and the casing drove to a depth of 6.81 ft bgs 10.42 - (3.5 + 0.11). Blow count 6/7/7/8/8/7/11.				
12:18	14:20	The casing is out of align. The casing was pulled out of the ground and realigned.				
14:20	15:30	The wind has picked up to >20 mph (14:30). The Tank Farm is shut down. The rig and associated equipment has been placed in a safe configuration. Personnel exit the farm.				
		NOTE 1: Mr. Curry states his neck is feeling better.				
REPORT BY: DE Skoglie		REVIEWED BY: MG Gardner				
TITLE: Field Team Lead		TITLE: Project Manager				
SIGNATURE: <i>David E. Skoglie</i>		DATE: 8-13-02				
		SIGNATURE: <i>MG Gardner</i>				

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 05		DATE: May 03, 2002 Friday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily Safety meeting and realignment of drill/hydraulic jacks. Drive casing.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 10.8 ft.		
CONSTRUCTION DESCRIPTION:				BORING DEPTH:		START TIME: 0700 END TIME: 1530 CONTRACTOR TIME: 0.5 TOTAL TIME: 8.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	6.81 ft	15.96 ft	
DOCUMENTED DOWN TIME				LOG SUMMARY		PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson H Sydnor Sharp (Optr) Jeff (HPT) R. Steffler/K. Young/F. Hall K. Reynolds/K. Flower
N/A				Bottom of 7" OD casing (start of shift) = 6.81 ft.		
WEATHER CONDITIONS (373-2716)				Bottom of 7" OD casing (end of shift) = 15.96 ft.		
08:30 hrs: NW 12 to 21mph; 52 F; humidity 42 %; barometric pressure 29.34 forecast wind continues through-out the day.				Casing (7 in OD) stick up (end of shift) = 1.05 ft.		
				Total casing = 20.41 ft		
				SAMPLE SUMMARY		
				S02046-02 (16.21 to 17.61 ft [#1]) @ 15:34		
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:10	Equipment daily inspection was completed. Conduct Daily Safety meeting. No questions or concerns noted.				
07:10	08:25	Mr. Flower stated that the drill mast will not align with the hydraulic jacks. The jacks were rotated 90 degrees. This action was completed @ 08:25. Aligned drill unit.				
08:25	08:42	The grating was cut to fit the access holes. The pipe was readied for driving. Hydraulic jacks are chained down.				
08:42	08:56	Check alignment with hammer in position. Alignment is good.				
08:56	09:30	Drive pipe, minimal distances (1 – 3 strokes at a time) and checking pipe plum.				
09:30	10:14	Adding casing/pipe. Casing 5.0/Dp 5.01 ft. Total casing 10.42 + 5.0 = 15.42 ft.				
10:14	10:23	Drive casing, stick-up 0.93 ft. 15.42 – 4.33 (su) = 11.09 ft bgs. Blow count 9/10/10/9.				
10:23	11:13	Pickup 4.99 casing and 5.0 drill pipe. Total casing 15.42 + 4.99 = 20.41 ft.				
11:13	11:20	Drive casing. SU = 0.8 ft. 20.41 – 4.2 = 16.21 ft bgs. Blow count 13/14/15/14/12. Back-pull casing 0.25 ft (casing @ 15.96 ft bgs).				
11:20	11:55	lunch				
11:55	13:30	Enter Tank Farm Service chain sprocket (loose allen screw). Electrical system short (manipulator arm shut off switch), located and repaired.				
13:30	14:32	Trip out Dp. Trip in the sampler.				
14:33	14:34	Drive sampler 16.21 – 17.61 ft. (1.4 ft). Blow count 2/2/3.				
14:34	15:34	Sampler placed in drum @ 15:34 hrs. Sample transported to PNNL laboratory.				
		Site secured.				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-13-02		



# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 5Page 2 of 2

Sample No. 502046 Sample Tracking No. 02  
 Target Depth 15 to 16  
 (1) 3.4 top of rig floor above ground  
 (2) 4.2 casing stickup above ground  
 Csg Total (3) 20.41 - Stickup (2) 4.2 = TD (4) 16.21  
 Does not include drive head  
 Backpull stickup (2+5) 4.79  
 Sample depth (4) 16.21 to (4+6)

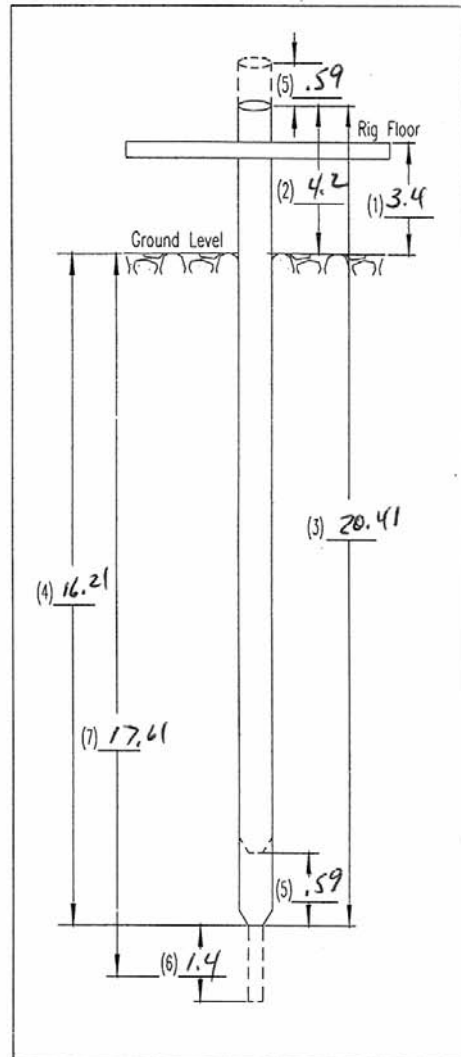
### Blow Count

	.5 ft	1 ft	1.5 ft
Start Time			
1433	2	2	3
End Time			
1433			

1.4 ft ~~del~~Estimated Recovery: Full

### Remarks:

- 1) Sample in bbl @ 15134 hrs.
- 2) Sample 502046-01 is an Equipment blank taken May 02, 2002 @ 12:05 hrs.
- 3) WORK PLANS Sample number 1.
- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

DATE:

SIGNATURE:


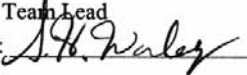

David S. Shoglin 5/03/02

REVIEWED BY (Please print): MG GARNERTITLE: Manager


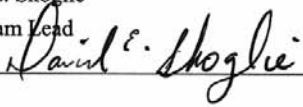

DATE:

SIGNATURE:

8-13-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>			
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>					Page 1 of 1
WELL I.D.: C3832		WELL NUMBER:		REPORT NUMBER: 06	DATE: May 06, 2002 Monday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily Pre-Job Safety meeting and advance casing, sample planned at 28'. Drill maintenance required.				REFERENCE: DFSNW-DOW-006, Rev. 0	LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 8.41 ft.	
CONSTRUCTION DESCRIPTION:				BORING DEPTH:	
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH
7.0 " OD	NA	CS	Shoe, 7.5 " OD	15.96 ft	26.02 ft
				START: 17.61 ft	
				END: 26.02 ft	
DOCUMENTED DOWN TIME			LOG SUMMARY		PERSONNEL:
N/A			Bottom of 7 " OD casing (start of shift) = 15.96 ft		OPERATOR: KC Olson
			Bottom of 7 " OD casing (end of shift) = 26.02 ft.		DL Curry/DE Morris
			Casing (7 in OD) stick up (end of shift) = 0.97 ft.		WA LICENSE #: 1217
			Total casing = 30.39 ft (constant 3.4 ft)		OTHER:
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY		K Johnson H Sydnor
N/A			N/A		Snook and Sharp (Optr)
					K Hartelius (HPT) S.H. Worley,
					K.D. Reynolds, K. Flower
TIME		DESCRIPTION OF OPERATIONS/REMARKS			
FROM	TO				
07:30	08:00	POD – Sample hold times, Leave sample loading arm resting on safe place while not in use.			
08:15	08:30	Worley Aced in (Must be escorted, has not turned in 3 day supervisor training.)			
08:54	09:10	Added 4.98' with arm. Flower reviews deck safety with Worley.			
09:34		Changed 18" sub to 1' sub so drive head would reach over the string. Reynolds marks casing in ft increments.			
09:56		Set up to back-pull ~2', and see if a chain could be attached to pull string straight. No attachment to fasten chain. Gave up chain pulling operation.			
10:08		Gardner, Sweeney arrive at site.			
10:14	10:16	Drive casing: (PULL BACK 1') 15.21' – 20.68'. Blow counts 13/14/13/13/12. Set next 5 ft set of casings.			
10:42		Reynolds marks casing in 1' increments. Drive casing 20.68 – 26.02 ft. Blow counts 10/9/12/14/6/15.			
11:00	11:11	Add 2' (30.39 S.U. – (.97+3.4) = 26.02) Set Hammer. Broken Hydraulic line. Attempt to find problem line...			
11:15		Rig Repair.			
11:45	12:19	Out of Farm for Lunch. Back in farm to review problems			
12:19		Rig Repair assesment.			
1:00		Darwin arrived waiting on Rob Dobush			
		Note: Problem is there is a hydraulic line that wraps under the hoisting gear/chain. The hydraulic line wore through. Corrective action is to have line rerouted to remove the potential wear point.			
1:56	3:30	Kellie and Dennis, and Dave back in the farm working repairs. Area Secured.			
REPORT BY: S.H. Worley				REVIEWED BY: MG Gardner	
TITLE: Field Team Lead				TITLE: Project Manager	
SIGNATURE: 				DATE: 8-13-02	
				SIGNATURE: 	



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 07		DATE: May 07, 2002 Tuesday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily Pre-Job Safety meeting, drill unit repair and driving casing. Obtain sample number two (28-29 interval).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 3.47 ft.		
CONSTRUCTION DESCRIPTION:				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	26.02 ft	27.84 ft	
DOCUMENTED DOWN TIME				LOG SUMMARY		PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson H Sydnor Snook and Sharp (Optr) K Hartelius (HPT) S.H. Worley, K.D. Reynolds, K. Flower
N/A				Bottom of 7" OD casing (start of shift) = 26.02 ft		
				Bottom of 7" OD casing (end of shift) = 27.84 ft.		
				Casing (7 in OD) stick up (end of shift) = 0.9 ft.		
				Total casing = 32.39 ft. (Constant 3.4 ft)		
				SAMPLE SUMMARY		
WEATHER CONDITIONS (373-2716)				S02046-03 28.09 to 29.49 ft (#2) 14:40 hrs.		
11:30: Wind 10-18 NW; temperature 56 F, barometric pressure 29.38, humidity 48%						
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	10:30	Drill unit repair, that is, two hydraulic lines replaced, a spacer was placed between the two sprockets on the lower shaft. This will eliminate movement of the sprockets. A center detent valve was installed on the drill head feed system. Hydraulic oil was cleaned up and barreled.				
		NOTE 1: The fire extinguisher inspector inspected all onsite fire extinguishers. All extinguishers passed.				
		NOTE 2: Mr. Olson was set-up with a noise monitor. Mr. Sweesy will evaluate data and review with TX personnel.				
10:30	10:50	Inspect hydraulic hoses, valves and controls to verify operation.				
10:50	11:00	The casing was drove to a depth of 28.09 ft bgs. Blow count is 15/15. The casing was pulled back 0.25 ft. (casing @ 27.84 ft bgs).				
11:00	11:38	Initiate pipe (4.5 inch) removal. Chain down the hydraulic jacks.				
11:38	12:10	Lunch				
12:10	13:25	Complete alignment and securing of hydraulic jacks.				
13:25	14:01	Trip in sampler and set up hammer. (14:00). Drive sample (S02046-02) from 28.09 to 29.49 ft bgs (1.4 ft). Blows count is 1/3/2.				
14:01	14:40	Trip sample out of bore hole and place in barrel @ 14:40 hrs. Sample was shipped to PNNL laboratory.				
14:40	15:30	Evaluate alignment and jacks for secure.				
15:30	16:30	Secure site and complete documentation.				
REPORT BY: DE. Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-13-02		
				SIGNATURE: 		



# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 7Page 2 of 2

Sample No. 502046 Sample Tracking No. 03  
 Target Depth 28 to 29  
 (1) 3.4 top of rig floor above ground  
 (2) 4.3 casing stickup above ground  
 Csg Total (3) 32.39 - Stickup (2) 4.3 = TD (4) 28.09  
 Does not include drive head  
 Backpull stickup (2+5) 4.76  
 Sample depth (4) 28.09 to (4+6) (1.4) 29.49

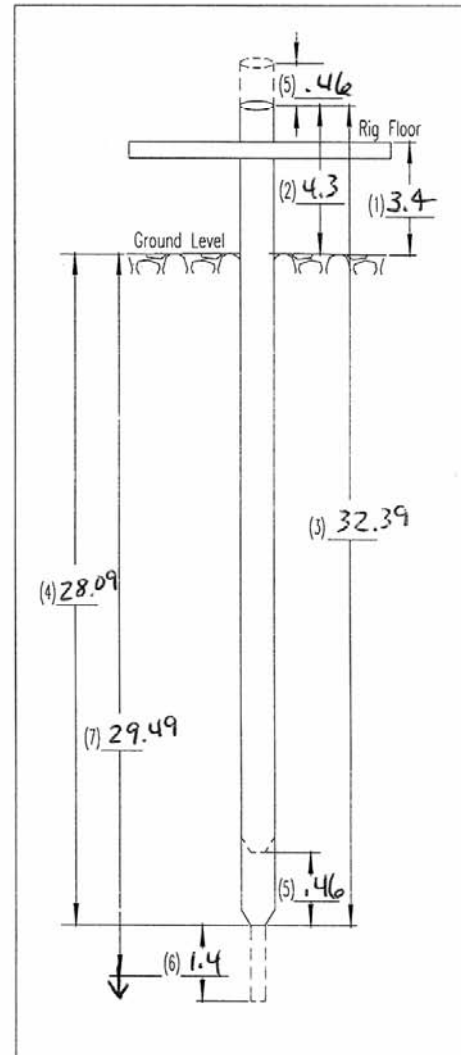
Blow Count			
	.5 ft	1 ft	1.4 ft
Start Time	1	3	2
End Time			
<u>14:01</u>			

Estimated Recovery: Full

Remarks: floor hand touched end of sampler with gloves.


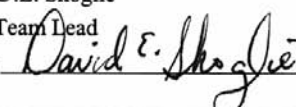

Sample in bbl @ 14:40 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE: David E. Hoglie DATE: 5/07/02SIGNATURE: [Signature]REVIEWED BY (Please print): MCGARONERTITLE: Manager DATE: 8-13-02SIGNATURE: [Signature]

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 08		DATE: May 08, 2002 Wednesday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting, drill Driving casing. Obtain sample number S02046-04.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 14.35 ft.		
CONSTRUCTION DESCRIPTION:						BORING DEPTH: START: 29.49 ft  END: 44.14 ft  START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0 " OD	NA	CS	Shoe, 7.5 " OD	27.84 ft	43.84ft	
DOCUMENTED DOWN TIME		LOG SUMMARY				PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson H Sydnor Snook and Sharp (Optr) K Hartelius (HPT) K.D. Reynolds, K. Flower
N/A		Bottom of 7 " OD casing (start of shift) = 27.84 ft.				
		Bottom of 7" OD casing (end of shift) = 43.84 ft.				
		Casing (7 in OD) stick up (end of shift) = 1.15 ft.				
		Total casing = 48.39 ft (Constant 3.4 ft)				
WEATHER CONDITIONS (373-2716)		SAMPLE SUMMARY				
11:30: Wind minimal; temperature 63 F, barometric pressure 29.38, humidity 48%		S02046-04 (36.01 to 37.89 ft) @ 10:45 hrs. (#3)				
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:40	Equipment inspection performed equipment fueled and completed. A Daily safety meeting wasa conducted. A Weekly safety meeting was conducted.				
07:40	07:55	Prep to drive casing. Casing bottom @ 27.84 ft. Total casing 35.39 ft. Casing SU 3.4 ft.				
07:55	08:29	Drive casing. Casing SU (rig floor 3.4 = 1.4 = 4.8 ft). Blow counts 9/10. Total casing 35.39 – 4.8 = 30.59 ft shoe depth (07:56). Add casing 35.39 + 5.0 = 40.39 ft.				
08:29	08:31	Set hammer prep to drive. Drive Casing 40.39 – (3.4 + 0.9 ) = 4.3 = 36.09 bottom of casing (08:32). Blow counts 3/8/6/6/7/6.				
08:32	09:15	Break head out/Prep to sample. Trip out of borehole – on bank. Trip took 35 minutes.				
09:15	10:00	Pick up sampler and run in borehole. 5.67 + 10.01 + 10.02 + 10.01.				
10:00		Adjusting string length. Drive sample 1.2 ft. 1/1/1 (3 blows total) 10:11. Trip sampler out of borehole.				
	11:29	Trip in. Pickup casing 5.0 ft (40.39 + 5 = 45.39 ft.). Drive casing. Blow counts 14/12/13/13. Lunch 12:15				
12:15	13:05	Set up to drive casing 45.39 – (3.4 + 1.06) = 40.93 bottom casing. Pickup 3.0 casing 45.39 + 3.0 + 48.39 ft. 3.01 dp 46.11 + 3.01 = 49.12 ft.				
13:05	14:15	Drive pipe 48.39 – (3.4 + 0.85) = 44.14 bottom of casing (13:06). Trip out for sample. Bent wrench float pin stop for repairs (13:15). Obtain Hot Work Permit and repair wrenches (welding). Blow counts 13/10/8/9.				
14:15	15:00	Backpull casing 0.25 ft. 48.39 – (3.4 + 1.15) = 43.84 bottom casing.				
15:00	15:30	Trip in the sampler and place on the bottom. Sample string 5.67 + 10.01 + 10.02 + 10.01 + 13.0 + 6.2 = 54.91 – 44 = 10.91 above ground. Secure zone (plastic over boring). Sample shipped to PNNL laboratory.				
REPORT BY: D.E. Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-13-02		
				SIGNATURE: 		





## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 8Page 2 of 2

Sample No. S02046 - Sample Tracking No. 04  
 Target Depth 37 to 38  
 (1) 3.4 top of rig floor above ground  
 (2) 4.3 casing stickup above ground  
 Csg Total (3) 40.39 - Stickup (2) 4.3 = TD (4) 36.09  
 Does not include drive head  
 Backpull stickup (2+5) 4.55  
 Sample depth (4) 36.09 to (4+6) (1.8) 37.89

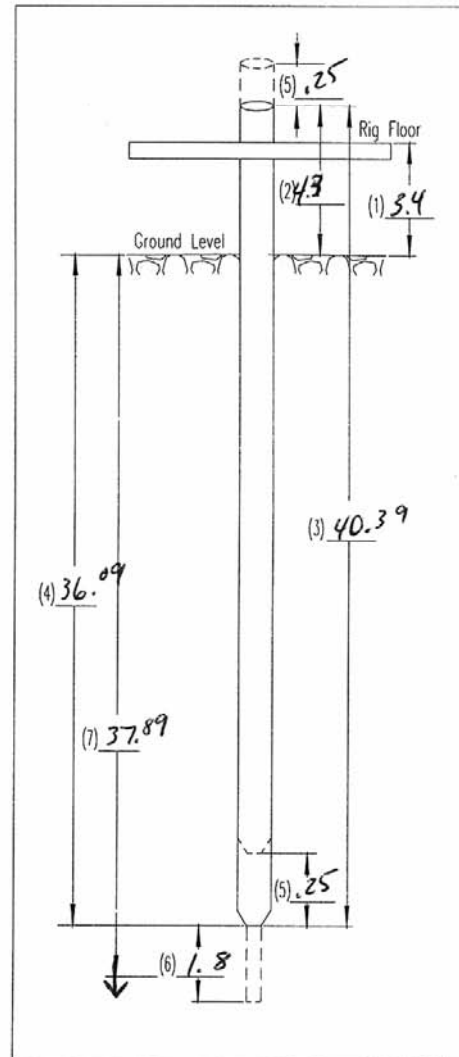
Blow Count			
	.5 ft	1 ft	<u>1.8 ft</u> <i>add</i>
Start Time			
End Time			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 10:45 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
     Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6






PREPARED BY (Please print):

TITLE:

SIGNATURE: Paul H. HodgeDATE: 5/08/02REVIEWED BY (Please print): MCBARNERTITLE: ManagerSIGNATURE: McBarn

DATE:

8-13-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 3
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 09		DATE: May 09, 2002 Thursday
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting, drill Driving casing. Obtain sample number 4 and 5a.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 8.44 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	43.84 ft	50.93 ft	END: 52.58 ft
DOCUMENTED DOWN TIME			LOG SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson H Sydnor Snook and Sharp (Optr) K Hartelius (HPT) K.D. Reynolds, K. Flower
N/A			Bottom of 7" OD casing (start of shift) = 43.84 ft.			
			Bottom of 7" OD casing (end of shift) = 50.93 ft.			
			Casing (7" OD) stick up (end of shift) = 1.05 ft.			
			Total casing 55.38 ft. (Constant 3.4 ft).			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			
11:30: Wind N @ 8 mph; temperature 57F, barometric pressure 29.34, humidity 46%.			Sample: S02046-05 (#4) 44.14 – 45.54 @ 08:40 hrs. Sample: S02046-06 (#5a) 51.18 – 52.58 @ 15:15 hrs.			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:45	Equipment inspection performed equipment fueled and completed. A Daily safety meeting was conducted.				
07:45	07:53	Set-up hammer. Drive Sampler (1.4 ft) 44.14 – 45.54 (sample string 54.91 – 3.4 – 6.12 [9.52]). BC 3/3/4				
07:53	08:33	Trip pipe and sampler from borehole. The sampler has moisture in the sample. A e-tape and steel tape was ran to evaluate for standing water. No indication of standing water. The boring will sit until 09:30.				
08:33	09:30	A 3 ft section of casing was removed. Total casing length is 45.39 ft bgs.				
09:30	10:30	No standing water in borehole (09:38). Add casing/dp (5.0/5.0 ft).				
10:30	11:12	Set hammer on casing. The weight pushed the casing back to bottom. Drive casing @ 10:30, SU 1.04 ft shoe @ 45.95 ft bgs (50.39 – 3.4 – 1.04 = 45.95 ft). Blow count 18/31. Add casing 4.99/dp4.99.				
11:12	11:24	Drive casing, shoe @ 51.18 ft bgs (55.38 – 3.4 – 0.8 = 51.18 ft bgs). Back-pull casing 0.25 ft (3 inch). Blow count 32/30/29/27.				
11:24	12:00	Remove drive head initiate pipe removal. A hydraulic leak has started at the bottom of the mast. The leak will be evaluated further after lunch. A call was made to BSE shop and an O-ring kit is on the way.				
12:00	12:40	Lunch (bbq chicken w/pineapple and a slice of American).				
12:40	13:50	Remove hydraulic brake valve and evaluate. An O-ring was replaced (13:35) Trip Dp/tip out @ 13:50 hrs.				
13:50	14:30	The sampler is run into the boring. Depth to bottom is 51.18 ft bgs.				
14:30	14:34	The hammer is set-up to drive sampler.				
14:34	14:35	Drive the sampler 1.4 ft (51.18 – 52.58 ft). Blow count is 3/3/1.5.				
14:35	15:06	Trip the sampler out of the borehole. 15:25 ship to PNNL laboratory.				
15:06	16:30	Secure site. Complete reports (DFSNW/BSE/CHG).				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		


**Duratek Federal Services, Inc., Northwest Operations**
**SAMPLE FORM**
FAR No. 9Page 2 of 3

Sample No. 502046 Sample Tracking No. 05  
 Target Depth 44 to 45  
 (1) 3.4 top of rig floor above ground  
 (2) 4.25 casing stickup above ground  
 Csg Total (3) 48.39 - Stickup (2) 4.25 = TD (4) 44.14  
 Does not include drive head  
 Backpull stickup (2+5) 4.5  
 Sample depth (4) 44.15 to (4+6) 45.54 (1.4)

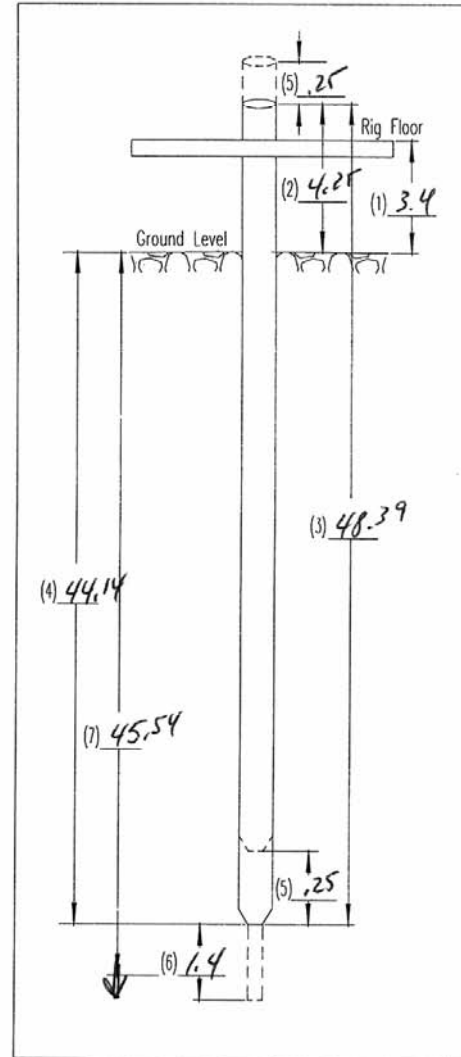
Blow Count			
	.5 ft	1 ft	1.4 ft
Start Time			
<u>0750</u>	<u>3</u>	<u>3</u>	<u>4</u>
End Time			
<u>0753</u>			

Estimated Recovery: Full

Remarks:

N/ASample in site 08:40 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
 Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

SIGNATURE: Paul E. Doyle

DATE:

5/09/02REVIEWED BY (Please print): MO BARONETITLE: Manager

DATE:

SIGNATURE: M. Barone8-15-02



## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 9Page 3 of 3Sample No. 502046 Sample Tracking No. 06Target Depth 52 to 53(1) 3.4 top of rig floor above ground(2) 4.2 casing stickup above groundCsg Total (3) 55.38 - Stickup (2) 4.2 = TD (4) 51.18

Does not include drive head

Backpull stickup (2+5) 4.45Sample depth (4) 51.18 to (4+6) 52.58

## Blow Count

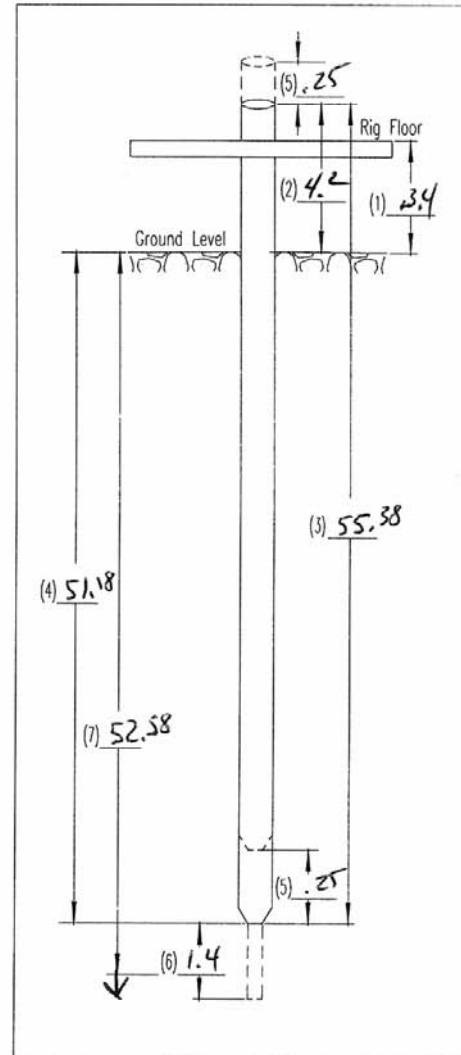
	.5 ft	1 ft	1.4 ft
Start Time <u>14:34</u>	<u>3</u>	<u>3</u>	<u>2</u>
End Time <u>14:35</u>			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 15:15 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
     Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:


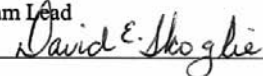

SIGNATURE: David E. MoghriDATE: 5/09/02

REVIEWED BY (Please print):

TITLE: ManagerSIGNATURE: [Signature]

DATE:

8-15-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>			
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>					Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 10	DATE: May 13, 2002 Monday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number 5b.				REFERENCE: DFSNW-DOW-006, Rev. 0	LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 7.54 ft.	
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH: START: 52.58 ft	
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH
7.0 " OD	NA	CS	Shoe, 7.5 " OD	50.93 ft	59.87 ft
				END: 60.12 ft	
DOCUMENTED DOWN TIME			LOG SUMMARY		PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson Snook and Sharp (Optr) K Hartelius (HPT) K.D. Reynolds
N/A			Bottom of 7 " OD casing (start of shift) = 50.93 ft.		
			Bottom of 7" OD casing (end of shift) = 59.87 ft.		
			Casing (7 " OD) stickup (end of shift) = 0.6 ft.		
			Total Casing = 64.37 ft (Constant = 3.4 ft)..		
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY		
07:00: Wind NW @ 7 mph; temperature 60F, Barometric pressure 29.24, Humidity 46%.			Sample obtained: S02046-07 (#5b) 53.08 – 54.43 ft.		
TIME		DESCRIPTION OF OPERATIONS/REMARKS			
FROM	TO				
07:00	07:37	A Daily safety meeting was conducted. An equipment inspection was conducted with no findings.			
07:37	08:42	Trip tip/dp into boring. Add a 2 ft section of casing/dp (57.38 – 3.4 – 0.9 = 53.08 ft.			
08:42	09:00	Drive casing to 53.08 ft bgs. Blow count 10/19. Back pull 0.25 ft.			
		NOTE 1: The dp jaws are loose. .003 was shaved this past weekend and new inserts placed, which are not as high. A spacer will be used to take up the space..			
09:00	10:06	Pulled dp from boring (09:25). The sampler was picked up and tripped into the boring.			
10:06	10:07	The sampler was drove 1.35 ft (53.08 – 54.43 [63.92 – 3.4 – 6.09 = 54.43 ft bgs]). Blow count 3/2/2.			
10:07	10:40	Trip the sampler to surface. The sampler is sleeved and placed in a drum. No radiological contamination.			
10:40	11:50	The drive tip/dp was ran in the boring. Casing was added 4.99 (60.37) and dp 5.0 (61.1). Connect head.			
11:50	12:00	Drive the casing to 55.87 ft bgs (60.37 – 3.4 – 1.1 = 55.87 ft bgs). Blows were 2/5/16/22.			
		NOTE 2: Stick up of the dp/head is 4.5 ft above the deck. Use this number when figuring su for driving.			
12:00	12:30	Lunch 12:30 – 12:40 Discussion on hydraulic fitting replacement.			
12:40	13:09	Add 4 ft casing/4 ft Dp. (60.37 + 4.0 = 64.37). Set up the drive head.			
13:09	13:12	Drive casing to 60.12 ft bgs. Blows were 24/29/32/30/8.			
13:12	13:16	Back pull casing .25 ft. (casing @ 50.93 ft bgs) S.U. = 0.6 ft.			
13:16	14:00	Trip Dp out of bore hole.			
14:00	14:40	Trip in bore hole with sampler. Land on bottom. Secure site. Sample is shipped to the PNNL laboratory.			
		NOTE 3: 14:56 Wind is kicking up to 25 mph. Dust is on the way!			
REPORT BY: DE Skoglie			REVIEWED BY: MG Gardner		
TITLE: Field Team Lead			TITLE: Project Manager		
SIGNATURE: 			DATE: 8-15-02		
			SIGNATURE: 		



## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 10Page 2 of 2Sample No. 302046 Sample Tracking No. 07Target Depth 53 to 54(1) 3.4 top of rig floor above ground(2) 4.55 casing stickup above groundCsg Total (3) 57.38 - Stickup (2) 4.55 = TD (4) 53.08

Does not include drive head

Backpull stickup (2+5) 4.55Sample depth (4) 53.08 to (4+6) 54.43 (1.35)

## Blow Count

1.35 ft

	.5 ft	1 ft	<u>1.5 ft</u> <u>DEA</u>
Start Time <u>10:06</u>	<u>3</u>	<u>2</u>	<u>2</u>
End Time <u>10:07</u>			

Estimated Recovery: Full

Remarks:

sample in bbl @ 10:50 hrs.

1 = Top of rig floor above ground

2 = Stickup of csg above ground 1 + measure from floor to top csg = SU

3 = Total csg length

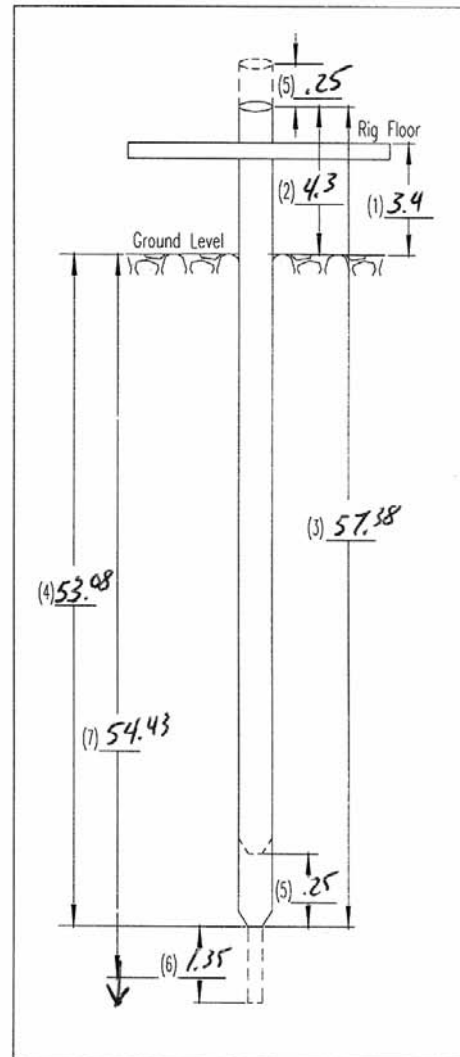
4 = Depth of csg = Total Depth (TD)

Total csg - SU<sup>(2)</sup> = TD

5 = Casing back pull

6 = Sampler drive distance

7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):




TITLE:

SIGNATURE: Paul C. ShoglinDATE: 05/13/02REVIEWED BY (Please print): MG GARDNERTITLE: ManagerSIGNATURE: [Signature]

DATE:

8-15-02



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 3
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 11		DATE: May 14, 2002 Tuesday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number 08 and 09 (see sample summary).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 8.89 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	59.87 ft	68.76ft	END: 69.01 ft
DOCUMENTED DOWN TIME			LOG SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson Snook and Sharp (Optr) K Hartelius (HPT) K.D. Reynolds
N/A			Bottom of 7" OD casing (start of shift) = 59.87 ft.			
			Bottom of 7" OD casing (end of shift) = 68.76 ft.			
			Casing (7 in OD) stick up (end of shift) = 1.2 ft.			
			Total Casing = 73.36 ft. (Constant 3.4 ft).			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			
07:00: Wind NW @ 6 mph; temperature 49F, Barometric pressure 29.45, Humidity 65%.			Sample: S02046-08 (#6a) @ 08:25 (60.12 – 61.52) Sample: S02046-09 (#6b) @ 13:40 (61.76 – 63.36)			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:15	Daily Safety meeting. Discuss anticipated operations. No questions or concerns.				
07:15	07:33	Equipment inspection performed, no deficiencies noted.				
07:33	07:41	Set-up hammer. Drive sample (S02046-08) from 60.12 – 61.52 ft (1.4 ft). 71.92 – (3.4 + 0.85 = 60.12) = 7.55 S.U. Blows are 3/3//2.				
07:41	08:20	Trip sampler from borehole. Land sampler (S02046-08 [#6a]) in drum @ 08:25 hrs.				
08:20	08:55	Back pull 4 ft casing. Evaluate hydraulic lines when mast travels. Clean casing slips.				
08:55	09:43	Trip Dp into boring (09:23). Set-up drill head and add casing 5 ft. (65.36 ft).				
09:43	10:17	Drive casing (65.36 – [3.4 + 1.15]) = 60.81 ft bgs (09:47). Add a 2 ft section of casing/Dp.				
10:17	10:58	Drive casing 67.36 – [3.4 + 2.2] = 61.76 ft bgs (10:41). Disassemble drive head/remove 2 ft casing/Dp.				
10:58	11:35	Trip Dp out of casing. Exit TX Tank Farm for lunch 11:35. 11:35 - 12:05. Lunch				
12:05	12:59	Trip sampler into boring. Set-up drive head.				
12:59	13:02	Drive sample (S02046-09) from 61.76 – 63.36 ft. (1.6 ft). 67.36 – (3.4 + 2.2) = 61.76 ft. Blows are 3/2/3.				
13:02	13:40	Sampler tripped from boring (S02046-09 [#6b]). Place in barrel @ 13:40 hrs.				
13:40	14:20	Trip Dp into boring (14:00). Add casing 5.0/Dp 5.0. Total casing 70.36 ft. Total Dp 71.1 ft).				
14:20	14:27	Hammer set-up (14:24). Drive casing to a depth of 65.86 ft bgs (70.36 – [3.4 + 1.1] = 65.86 ft).				
14:27	14:51	Drive head was disassembled. A section of casing (3.0 ft [total 73.36]) and Dp (3.0 [total 74.1]) was added.				
14:51	14:54	Drive casing to 69.01 ft bgs (73.36 – [3.4 + .95] = 69.01 ft bgs. Back pull casing .25 ft.(casing @ 68.76 ft).				
14:54	15:30	Initiate Dp pull. Dp slips will be reworked tonight. Samples shipped to laboratory. Area Secured.				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		



## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 11Page 2 of 3

Sample No. S02046 Sample Tracking No. 08  
 Target Depth 61 to 62  
 (1) 3.4 top of rig floor above ground  
 (2) 4.25 casing stickup above ground  
 Csg Total (3) 64.37 - Stickup (2) 4.25 = TD (4) 60.12  
 Does not include drive head  
 Backpull stickup (2+5) 4.5  
 Sample depth (4) 60.12 to (4+6) 61.52 (1.4)

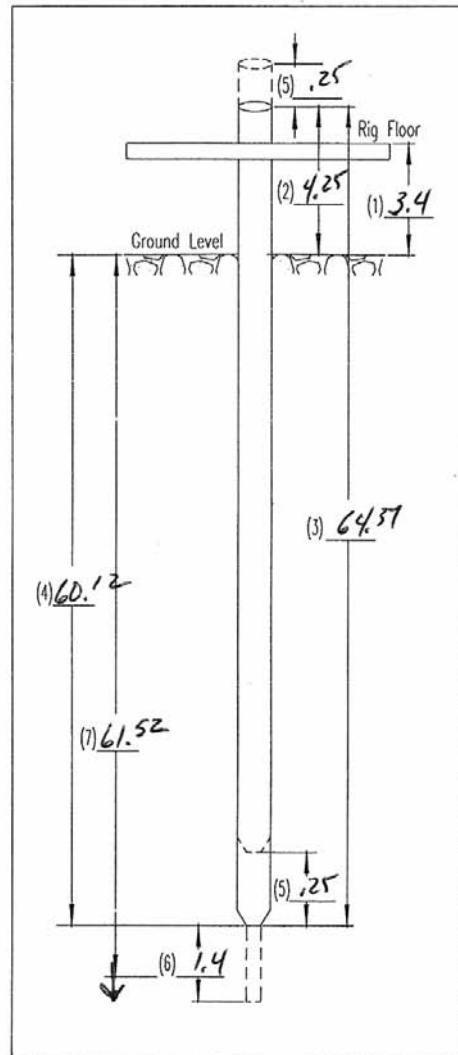
Blow Count			
	.5 ft	1 ft	1.4 ft
Start Time			
<u>0740</u>	<u>3</u>	<u>3</u>	<u>2</u>
End Time			
<u>0741</u>			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 08:25 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
 Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

SIGNATURE: David E. Shoglie DATE: 5/14/02REVIEWED BY (Please print): MB GARDNERTITLE: Manager

DATE:

SIGNATURE: MB Gardner8-15-02





# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 11Page 3 of 3Sample No. 502046 Sample Tracking No. 09Target Depth 62 to 63(1) 3.4 top of rig floor above ground(2) 5.6 casing stickup above groundCsg Total (3) 67.36 - Stickup (2) 5.6 = TD (4) 61.76

Does not include drive head

Backpull stickup (2+5) 5.92Sample depth (4) 61.76 to (4+6) 63.36 (1.6)

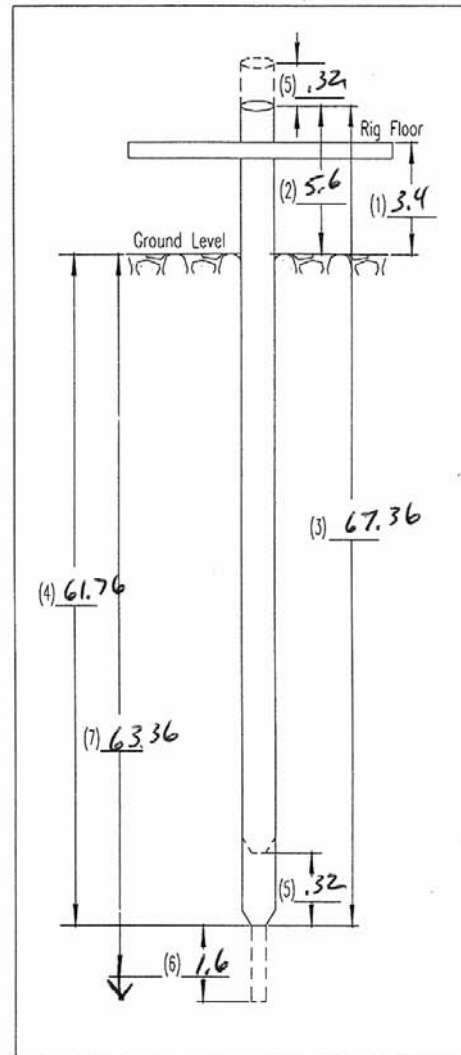
### Blow Count

	.5 ft	1 ft	<u>1.6 ft</u> <sup>DET</sup>
Start Time <u>12:59</u>	<u>3</u>	<u>2</u>	<u>3</u>
End Time <u>13:02</u>			

Estimated Recovery: Full

Remarks: sample in  
66L @ 13:40 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6




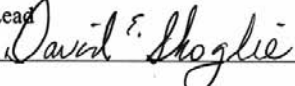

PREPARED BY (Please print):

TITLE:

SIGNATURE: Paul E. ShogheDATE: 05/14/02REVIEWED BY (Please print): MG BARNERTITLE: ManagerSIGNATURE: MG BARNER

DATE:

8-15-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>						
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>								Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 12		DATE: May 15, 2002 Wednesday		
CONTRACT NUMBER: 8248-55			START CARD NO: S00630			RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number S02046-10 (#7) (see sample summary).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West		
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 6.98 ft.				
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700		
CASING SIZE		SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	END TIME: 1630	
7.0 " OD		NA	CS	Shoe, 7.5 " OD	68.76 ft	75.74 ft	CONTRACTOR TIME: 0.5	
				END: 75.99 ft		TOTAL TIME: 9.5		
DOCUMENTED DOWNTIME				CASING SUMMARY		PERSONNEL:		
N/A				Bottom of 7 " OD casing (start of shift) = 68.76 ft.		OPERATOR: KC Olson		
				Bottom of 7" OD casing (end of shift) = 75.74ft.		DL Curry/DE Morris		
				Casing (7 in OD) stick up (end of shift) = 1.2 ft.		WA LICENSE #: 1217		
				Total Casing = 80.34 ft. (Constant = 3.4 ft.)		OTHER: D Skoglie		
WEATHER CONDITIONS (373-2716)				SAMPLE SUMMARY		K Johnson		
07:00: Wind WNW @ 4 mph; temperature 49F, Barometric pressure 29.33, Humidity 48%.				Sample: S02046-10 (#7) @ 10:33 (69.01 – 70.31)		Snook and Sharp (Optr)		
						K Hartelius/J. Riley (HPT)		
						K. Reynolds/K. Flower		
TIME		DESCRIPTION OF OPERATIONS/REMARKS						
FROM	TO							
07:00	08:15	Conduct Daily safety meeting. Discuss anticipated activities. No questions or concerns. (07:15) The 4.5 inch slips have been reworked and are onsite. A 4.5 Dp was removed from the drill string due to belling (Dp was 25 ft from surface). Perform equipment/piping inspection. Secure hydraulic lines. System tested for torque. Rotary head @ 3400 psig.						
08:15	09:20	Trip sampler into boring. Set-up hammer.						
09:20	09:22	Drive sample (S02046-10 (#7)) from 69.01 to 70.31 ft.). Blows 3/2/1. Drove sampler 1.3 ft.						
09:22	10:33	Evaluate and set drill unit alignment (09:50). Trip sample from boring (place in drum @ 10:33).						
10:33	10:40	Remove 3 ft section of casing.						
10:40	12:00	Tighten cable on hammer and perform maintenance on ICE Hammer.						
12:00	12:35	Lunch						
12:35	13:00	Add casing 4.99 (total 75.35) and Dp 5.01 (total 79.11). Set up hammer.						
13:00	13:09	Drive casing – dry fire 3 times to hit pre-driven bottom. Blows 1/1/15/22. 75.35 – (3.4 + 1.0) = 70.95 ft bgs.						
13:09	13:35	Add casing 4.99 (total 80.34) and Dp 5.0 (total 84.11). Set up hammer.						
13:35	13:39	Drive casing – blows 24/34/34/34/35. 80.34 – (3.4 + 0.95) = 75.99 ft bgs. Back pull casing 0.25 ft (75.74 ft.).						
13:39	14:15	Disassemble hammer/ drive head (13:52 hrs). Trip Dp out of bore hole. Set up sampler.						
14:15	15:00	Trip sampler to bottom and secure.						
15:00	15:30	Mr. John Riley received Deck Training. The slips for 4.5 and 7 inch were removed from the RBA for further work this evening. The site was secured. Sample was shipped to PNNL laboratory.						
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner				
TITLE: Field Team Lead				TITLE: Project Manager				
SIGNATURE: 				DATE: 8-15-02				
				SIGNATURE: 				


**Duratek Federal Services, Inc., Northwest Operations**
**SAMPLE FORM**
FAR No. 12Page 2 of 2

Sample No. 502046 Sample Tracking No. 10  
 Target Depth 69 to 70  
 (1) 3.4 top of rig floor above ground  
 (2) 4.35 casing stickup above ground  
 Csg Total (3) 73.36 - Stickup (2) 4.35 = TD (4) 69.01  
 Does not include drive head  
 Backpull stickup (2+5) 4.6  
 Sample depth (4) 69.01 to (4+6) 70.31 (1.3)

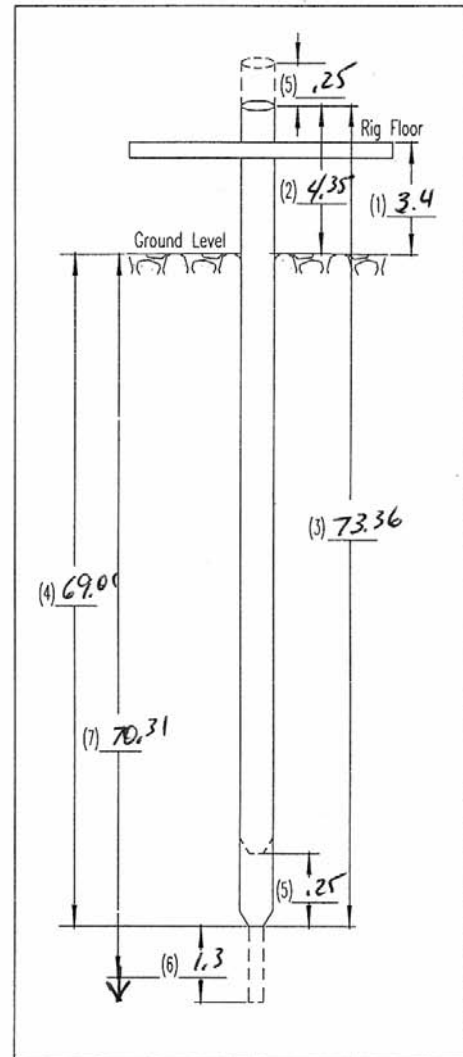
**Blow Count**

	.5 ft	1 ft	<u>1.3 ft</u> <i>del</i>
Start Time	<u>3</u>	<u>2</u>	<u>1</u>
End Time			
<u>09:20</u>			
<u>09:22</u>			

Estimated Recovery: Full
**Remarks:**

Sample in bbl @ 10:33 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
 Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6






PREPARED BY (Please print):

TITLE:

SIGNATURE: Daniel E. ShoglerDATE: 5/15/02REVIEWED BY (Please print): MC GARDNERTITLE: ManagerSIGNATURE: [Signature]

DATE:

8-15-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>					
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>							Page 1 of 3
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 13		DATE: May 16, 2002 Thursday	
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)			
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number S02046-11 (#8) and S02046-12 (#9).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West	
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 7.0 ft.			
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700	
				START: 75.99 ft		END TIME: 1630	
				END: 82.99 ft		CONTRACTOR TIME: 0.5	
						TOTAL TIME: 9.5	
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH		
7.0 " OD	NA	CS	Shoe, 7.5 " OD	75.74 ft	82.99 ft		
DOCUMENTED DOWNTIME				CASING SUMMARY		PERSONNEL:	
N/A				Bottom of 7 " OD casing (start of shift) = 75.74 ft.		OPERATOR: KC Olson	
				Bottom of 7" OD casing (end of shift) = 82.99 ft.		DL Curry/DE Morris	
				Casing (7 in OD) stick up (end of shift) = 0.95 ft.		WA LICENSE #: 1217	
				Total Casing = 87.34 ft. (Constant = 3.4 ft)		OTHER: D Skoglie	
WEATHER CONDITIONS (373-2716)				SAMPLE SUMMARY		K Johnson	
07:37: Wind SW @ 6 mph; temperature 50F, Barometric pressure 29.26, Humidity 50%.				Sample: S02046-11 (#8) @ 09:00 (75.99 – 77.39)		Snook and Sharp (Optr)	
				Sample: S02046-12 (#9) @13:17 (78.99 – 80.31)		K Hartelius (HPT)	
						K. Flower	
TIME		DESCRIPTION OF OPERATIONS/REMARKS					
FROM	TO						
07:00	07:37	Daily safety meeting, anticipated activities discussed. Also conducted a weekly safety meeting (discussed noise monitoring, safety surveillance/audit, equipment inspection, house-keeping and ladder use (07:37). Conduct equipment inspection (inspection passed).					
07:37	07:53	Set-up hammer.					
07:53	07:55	Drive sample S02046-11 (# 8) 75.99 – 77.39 ft. Blows Dry 1 3/2/1. Disassemble head, secure hammer.					
07:55	09:03	Adjust head and align (08:21). Trip sample out of boring and in drum @ 09:00 hrs.					
09:03	09:24	Evaluate mast chain spacer (another spacer will be fabricated). Pipe moved and staged in exclusion zone.					
09:24	10:07	Trip in Dp (09:55). Add casing 3 ft (total 83.34 ft) and Dp 3 ft (total 87.11 ft).					
10:07	10:14	Connect drive head and drive casing to a depth of 78.99 ft bgs. 83.34 – (3.4 + 0.95) = 78.99 ft bgs. Blows 1 dry /13/25/28					
10:14	11:08	Disassemble head. Back-pull casing .25 ft. (10:22). Trip out Dp (water break 10:30 – 10:43).					
11:08	11:55	Trip in with sampler. Land on bottom @ 11:45. Exit zone for lunch. Lunch 11:55 – 12:30.					
12:30	13:17	Set up hammer. Drive sample S02046-12 (#9) 78.99 – 80.31 ft. (12:40 – 12:41) Blows Dry 1/6/4/2. Disconnect and trip sample from boring. Sample in drum @ 13:17 hrs.					
13:17	14:08	Back-pull and remove casing (13:25). Trip Dp in boring.					
14:08	14:22	Add casing 5.0 (total 85.34) and Dp 5.01 (total 89.12 ft).					
14:22	14:47	Drive casing 85.34 – (3.4 + 0.9) = 81.04 ft bgs. (14:46). BC 14/13/26/27. Add casing 2 ft (87.34) and Dp 2 ft. (91.12 ft). Drive casing to 82.99 ft bgs. BC 26/27. Disconnect head. Area secured.					
14:47	16:30	Samples shipped to PNNL laboratory. Work on new drive head/documentation.					
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner			
TITLE: Field Team Lead				TITLE: Project Manager			
SIGNATURE: 				DATE: 8-15-02			
				SIGNATURE: 			



## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 13Page 2 of 3

Sample No. 502046 Sample Tracking No. 11  
 Target Depth 76 to 77  
 (1) 3.4 top of rig floor above ground  
 (2) 4.35 casing stickup above ground  
 Csg Total (3) 80.44 - Stickup (2) 4.35 = TD (4) 75.99  
 Does not include drive head  
 Backpull stickup (2+5) 4.6  
 Sample depth (4) 75.99 to (4+6) 77.39 (1.4)

## Blow Count

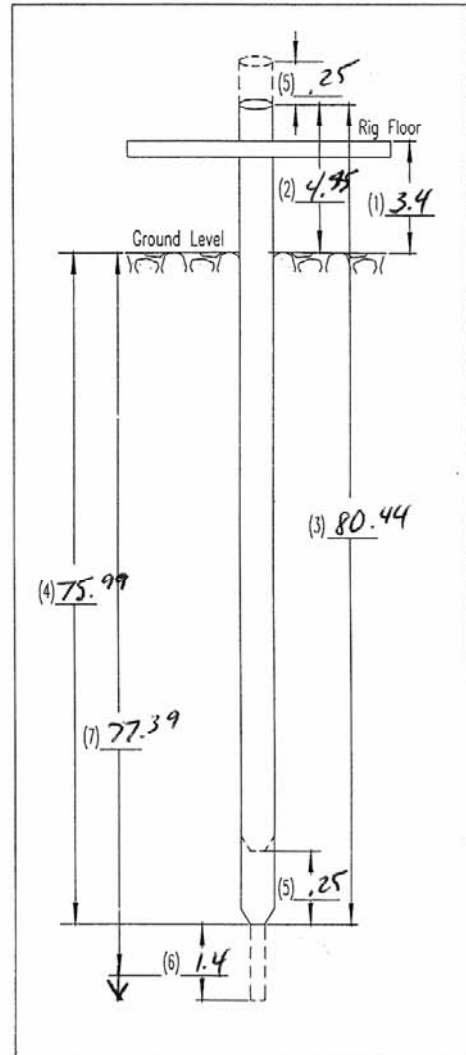
	.5 ft	1 ft	<u>1.4 ft</u>
Start Time <u>07:53</u>	<u>3</u>	<u>2</u>	<u>1</u>
End Time <u>07:55</u>			

Estimated Recovery: Full

## Remarks:

Sample in bbl @ 09:00 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
     Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

SIGNATURE: Daniel E. ShoglerDATE: 5/16/02

REVIEWED BY (Please print):

TITLE: ManagerSIGNATURE: [Signature]

DATE:

8-15-02



# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 13Page 3 of 3Sample No. 502046 Sample Tracking No. 12Target Depth 79 to 80(1) 3.4 top of rig floor above ground(2) 4.35 casing stickup above groundCsg Total (3) 83.34 - Stickup (2) 4.35 = TD (4) 78.99

Does not include drive head

Backpull stickup (2+5) 4.6Sample depth (4) 78.99 to (4+6) 80.31 (1.32)

### Blow Count

	.5 ft	1 ft	<u>1.32 ft</u> <sup>DET</sup>
Start Time <u>12:40</u>	<u>6</u>	<u>4</u>	<u>2</u>
End Time <u>12:41</u>			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 13:17 hrs.

1 = Top of rig floor above ground

2 = Stickup of csg above ground 1 + measure from floor to top csg = SU

3 = Total csg length

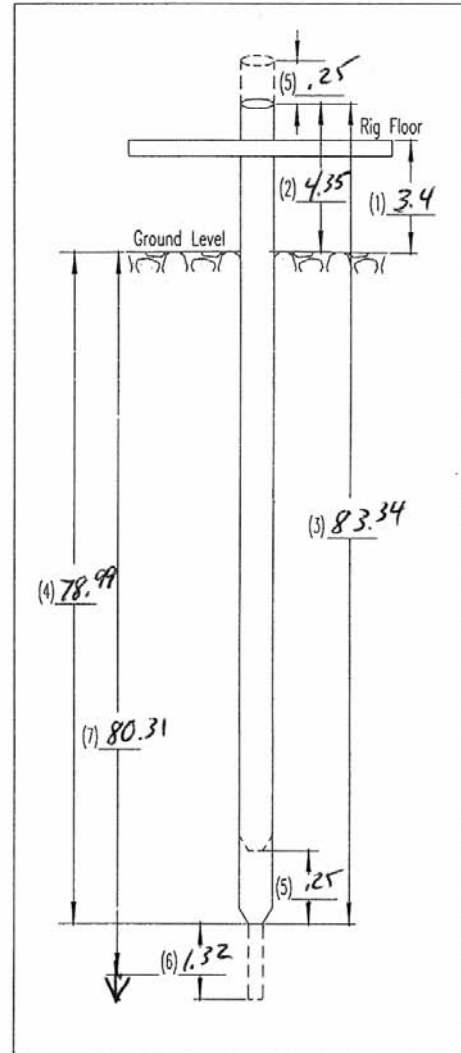
4 = Depth of csg = Total Depth (TD)

Total csg - SU<sup>(2)</sup> = TD

5 = Casing back pull

6 = Sampler drive distance

7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

DATE: 5/16/02SIGNATURE: Paul E. Shoghe




REVIEWED BY (Please print):

TITLE: Manager

DATE:

SIGNATURE: reblah8-15-02



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 14		DATE: May 17, 2002 Friday
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number S02046-13 (#10).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 4.0 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH: START: 82.99 ft END: 86.99 ft		START TIME: 0700 END TIME: 1530 CONTRACTOR TIME: 0.5 TOTAL TIME: 8.5
CASING SIZE 7.0" OD	SET-AT DEPTH NA	TYPE CASING CS	DRIVE POINT DIMENSION Shoe, 7.5" OD	START DEPTH 82.99 ft	END DEPTH 86.74 ft	
DOCUMENTED DOWNTIME  N/A			CASING SUMMARY Bottom of 7" OD casing (start of shift) = 82.99 ft. Bottom of 7" OD casing (end of shift) = 86.74 ft. Casing (7 in OD) stick up (end of shift) = 1.2 ft. Total Casing = 91.34 ft. (Constant 3.4 ft)			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson (Optr/PIC) K Hartelius (HPT) K. Flower
WEATHER CONDITIONS (373-2716)  07:21: Wind W @ 10 mph (gusts to 15 may pick up later; temperature 56F, Barometric pressure 29.26, Humidity 67%.			SAMPLE SUMMARY Sample: S02046-13 (#10) @ 11:55 (82.99 – 84.34)			
TIME FROM TO		DESCRIPTION OF OPERATIONS/REMARKS				
07:00 07:20		Daily safety meeting. Discuss anticipated activities. No questions or concerns. Mr. Morris left ring finger is bruised and swollen. J.Swessey/M. Gardner notified. H. Sydnor contacted. Mr Swessey will take Mr. Morris to Health Center for a check up. BSE also contacted, directed to have finger looked at by first aid.				
07:20 07:40		Equipment inspection performed. No deficiencies.				
07:40 08:38		Back pull casing .25 ft. Casing @ 82.74 ft bgs. Trip Dp out of boring (08:38 hrs.)				
08:38 10:30		Mr. Morris at first aid to check out his finger. The nurse RN Josephine Ocoma stated bruising of the fingertip (left 4 <sup>th</sup> finger). Return to work without restriction.				
10:30 11:05		Trip Dp/sampler into boring (11:04 hrs). Move center rod racks 11:05.				
11:05 11:12		Set drive head.				
11:12 11:13		Drive sampler 1.35 ft. 82.99 – 84.34 ft. Blow count 2/2/1. Sample number S02046-13 (#10). HPT states GM reading is slightly higher than back ground.				
11:13 11:55		Trip Dp out of boring. Sample in barrel @ 11:55 hrs.				
12:10 12:40		Lunch				
12:40 13:33		Trip Dp/tip to bottom.				
13:33 13:58		Add casing 4 ft (total 91.34 ft) and Dp 4 ft (total 95.12 ft).				
13:58 14:02		Drive casing (91.34 – (3.4 + 0.95) = 86.99 ft bgs. Blow count 14/19/19/25. Back pull casing 0.25 (86.74 ft bgs.				
14:02 15:30		Secure site and complete documentation. Sample shipped to PNNL laboratory.				
REPORT BY: DE Skoglie TITLE: Field Team Lead SIGNATURE: 				REVIEWED BY: MG Gardner TITLE: Project Manager SIGNATURE: 		
				DATE: 8-15-02		


**Duratek Federal Services, Inc., Northwest Operations**
**SAMPLE FORM**

 FAR No. 14 Page 2 of 2

 Sample No. 502046 Sample Tracking No. 13

 Target Depth 83 to 84

 Stickup (2) = rig floor to ground and casing (csg) above rig floor (1) 3.4 (2) 4.35

 Csg Total (3) 87.34 - Stickup (2) 4.35 = TD (4)

Does not include drive head

 Backpull stickup (2+5) 4.6

 Sample depth (4) 82.99 to (4+6) 84.34
**Blow Count**
1.35 ft.

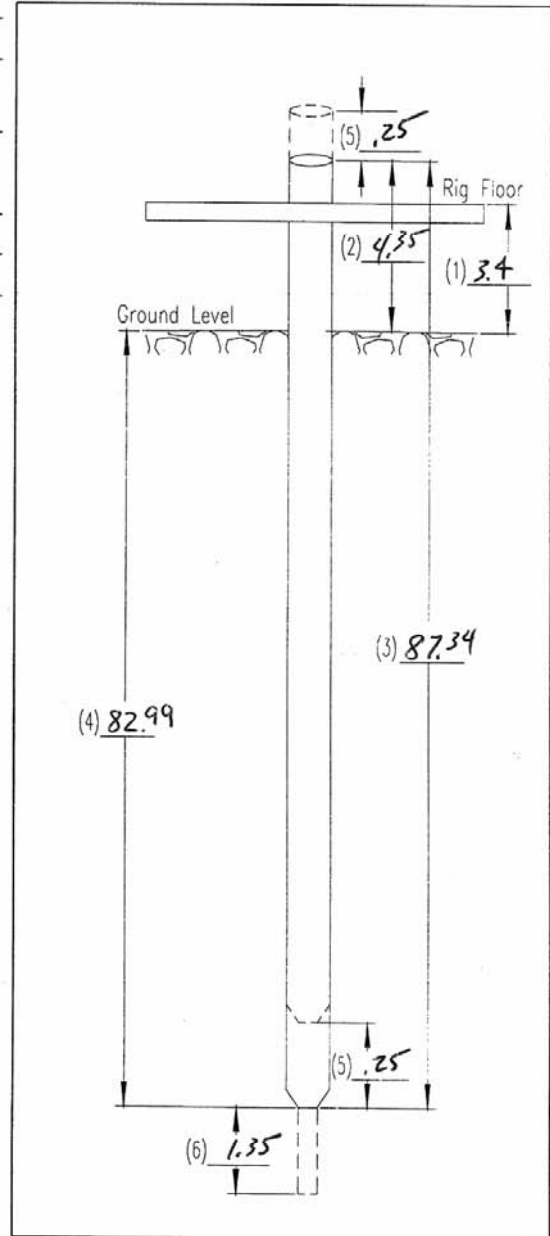
Start Time	.5 ft	1 ft	<u>1.35 ft</u>
End Time			
<u>11:12</u>	<u>2</u>	<u>2</u>	<u>1</u>
<u>11:13</u>			

 Estimated Recovery: Full

Remarks:

Sample in bbl @ 11:55 hrs.

- 1 = Height of rig above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
 Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance



PREPARED BY (Please print):

TITLE:

 SIGNATURE: David E. Shoglie

 DATE: 5/17/02

 REVIEWED BY (Please print): MB GARDNER


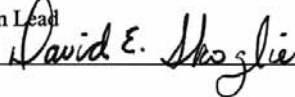

 TITLE: Manager


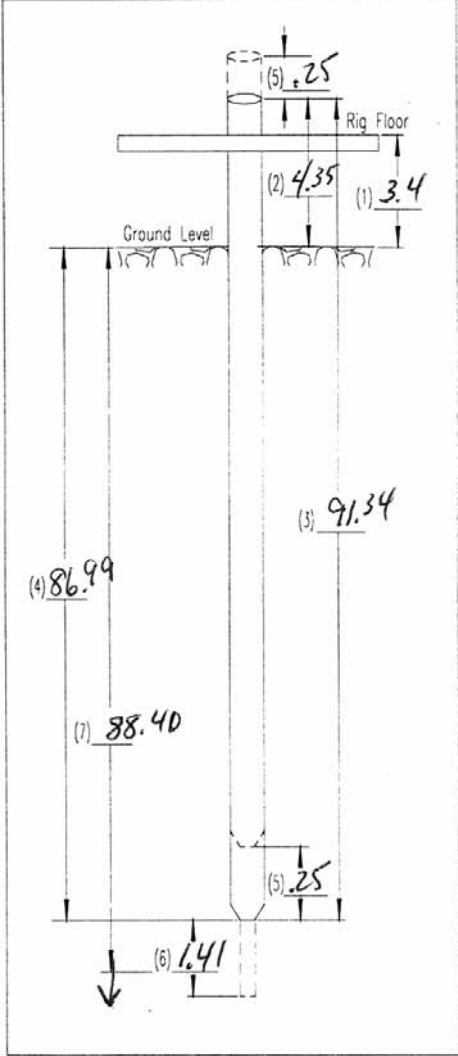
 SIGNATURE: [Signature]

DATE:

8-15-02



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 3
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 15		DATE: May 20, 2002 Monday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing. Obtain sample number S02046-14 (#11) and S02046-15 (#12).				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 7.41 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		
				START: 86.99 ft		
				END: 94.4 ft		
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	START TIME: 0700 END TIME: 1530 CONTRACTOR TIME: 0.5 TOTAL TIME: 8.5
7.0" OD	NA	CS	Shoe, 7.5" OD	86.74 ft	92.74 ft	
DOCUMENTED DOWNTIME			CASING SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson (Optr/PIC) K Hartelius (HPT) K. Flower K. Jones/J. Beck (BSE)
N/A			Bottom of 7" OD casing (start of shift) = 86.74 ft.			
			Bottom of 7" OD casing (end of shift) = 92.74 ft.			
			Casing (7 in OD) stick up (end of shift) = 1.2 ft.			
			Total Casing = 97.34 ft. (Constant = 3.4 ft)			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			
07:24: Wind SE @ 5 mph (gusts to 20 may pick up later; temperature 56F, Barometric pressure 29.01, Humidity 85%.			Sample: S02046-14 (#11) @ 10:00 (86.99 – 88.4) Sample: S02046-15 (#12) @ 15:10 (92.99 – 94.4)			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:55	Daily safety meeting. Discuss anticipated activities. No questions or concerns (07:20). Equipment inspection and maintenance completed. Mr. Beck and Jones travel to 272WA to ACE.				
07:55	09:15	Trip Dp out of boring (08:35 hrs.). Trip in Sampler (09:10 hrs.). Set up hammer.				
09:15	10:15	Drive sample 86.99 – 88.40 ft. (1.42 ft). Blows 1 dry 2/5/2 (09:18 hrs.). Trip sample from boring. Sample in bbl @ 10:00 hrs. Water break 10:15 hrs.				
10:15	11:04	Pull and remove casing (4 ft and 2 ft) 10:40 hrs. Trip Dp in boring.				
11:04	11:28	Add casing 5.0 ft (total 90.34 ft) and Dp .50 ft (total 94.12 ft). Set up hammer.				
11:28	12:05	Drive casing. Add casing 5.0 ft (total 95.34 ft) and Dp 5.01 (total 99.13 ft).				
12:05	12:35	Lunch				
12:35	12:56	Set up hammer (12:50 hrs). Drive casing to 95.34 – (3.4 + 0.95 ft) = 90.84 ft bgs. BC 11/12/17/23.				
12:56	13:13	Add casing 2 ft (total 97.34 ft) and Dp 2.0 ft (total 101.13 ft). Set up hammer.				
13:13	13:52	Drive casing to a depth of 97.34 – (3.4 + 0.95) = 92.99 ft. bgs ( 13:14 hrs.). BC 15/26. Back pull casing .25 ft. Casing @ 92.74 ft. bgs. Trip Dp out of boring.				
13:52	14:29	Trip sampler to bottom (14:23 hrs). Set up hammer.				
14:29	15:10	Drive sample (92.99 – 94.4 ft) 1.41 ft. Blows 1 dry 3/3/3 (14:30 hrs.) Trip sample out of boring (in drum) @ 15:10 hrs..				
15:10	15:45	Initiate Dp trip into boring. Initiate set-up of new design drive head.				
15:45	16:30	Secure site. Samples shipped to PNNL laboratory. Complete documentation.				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		

	<b>Duratek Federal Services, Inc., Northwest Operations</b>																								
<b>SAMPLE FORM</b>	FAR No. <u>15</u> Page <u>2</u> of <u>3</u>																								
Sample No. <u>502046</u> Sample Tracking No. <u>14</u> Target Depth <u>87</u> to <u>88</u> (1) <u>3.4</u> top of rig floor above ground (2) <u>4.35</u> casing stickup above ground Csg Total (3) <u>91.34</u> - Stickup (2) <u>4.35</u> = TD (4) <u>86.99</u> Does not include drive head Backpull stickup (2+5) <u>4.6</u> Sample depth (4) <u>86.99</u> to (4+6) <u>88.40</u>																									
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td colspan="2">Blow Count</td> <td><u>1.41 FT</u></td> </tr> <tr> <td></td> <td>.5 ft</td> <td>1 ft</td> <td><u>1.5 ft</u> D&amp;A</td> </tr> <tr> <td>Start Time</td> <td><u>2</u></td> <td><u>5</u></td> <td><u>2</u></td> </tr> <tr> <td>End Time</td> <td></td> <td></td> <td></td> </tr> <tr> <td><u>09:15</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td><u>09:18</u></td> <td></td> <td></td> <td></td> </tr> </table>			Blow Count		<u>1.41 FT</u>		.5 ft	1 ft	<u>1.5 ft</u> D&A	Start Time	<u>2</u>	<u>5</u>	<u>2</u>	End Time				<u>09:15</u>				<u>09:18</u>			
		Blow Count		<u>1.41 FT</u>																					
		.5 ft	1 ft	<u>1.5 ft</u> D&A																					
Start Time	<u>2</u>	<u>5</u>	<u>2</u>																						
End Time																									
<u>09:15</u>																									
<u>09:18</u>																									
Estimated Recovery: <u>Full</u> Remarks: <u>Sample in bbl @ 10:00 hrs.</u>																									
1 = Top of rig floor above ground 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU 3 = Total csg length 4 = Depth of csg = Total Depth (TD) Total csg - SU <sup>(2)</sup> = TD 5 = Casing back pull 6 = Sampler drive distance 7 = Total depth of driven sample = 4 + 6																									
PREPARED BY (Please print): TITLE: <u>Paul S. Thoghe</u> DATE: <u>5/20/02</u> SIGNATURE: <u>[Signature]</u>	REVIEWED BY (Please print): <u>MCGARVER</u> TITLE: <u>Manager</u> DATE: <u>8-15-02</u> SIGNATURE: <u>[Signature]</u>																								

DFSNW-WS-00


**Duratek Federal Services, Inc., Northwest Operations**
**SAMPLE FORM**
FAR No. 15Page 3 of 3

Sample No. 502046 Sample Tracking No. 15  
 Target Depth 93 to 94  
 (1) 3.4 top of rig floor above ground  
 (2) 4.35 casing stickup above ground  
 Csg Total (3) 97.34 - Stickup (2) 4.35 = TD (4) 92.99  
 Does not include drive head  
 Backpull stickup (2+5) 4.6  
 Sample depth (4) 92.99 to (4+6) 94.4 (1.41)

**Blow Count**

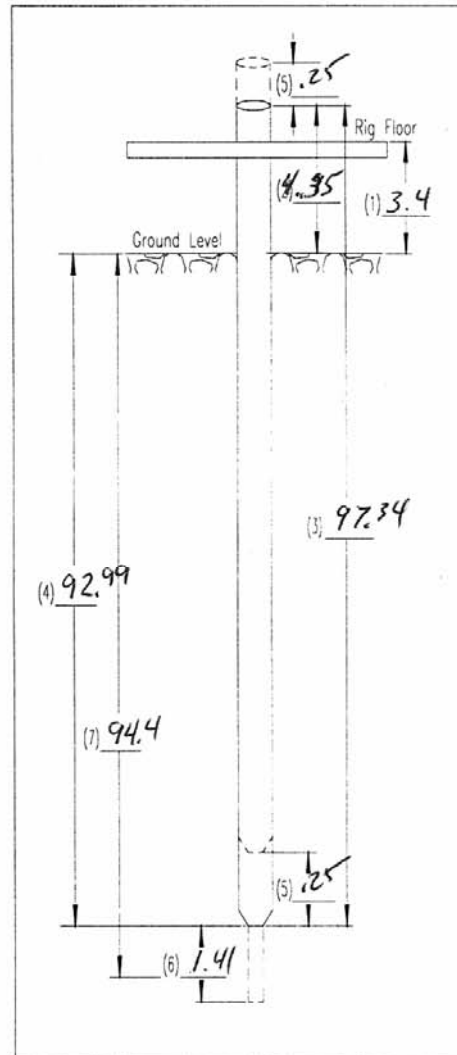
	.5 ft	1 ft	<u>1.5 ft</u> <sup>1.41 su (468)</sup>
Start Time 1429	3	3	3
End Time 1430			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 15:10 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:


SIGNATURE: David E. Shoglie

DATE:

5/20/02REVIEWED BY (Please print): M. BARNESTITLE: ManagerSIGNATURE: M. Barnes




DATE:

8-15-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>					
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>							Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 16		DATE: May 21, 2002 Tuesday	
CONTRACT NUMBER: 8248-55			START CARD NO: S00630			RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting, Driving casing.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West	
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 1.24 ft.			
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700	
CASING SIZE		SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	END TIME: 1630
7.0 " OD		NA	CS	Shoe, 7.5 " OD	92.74 ft	95.64 ft	CONTRACTOR TIME: 0.5
						TOTAL TIME: 9.5	
<b>DOCUMENTED DOWNTIME</b>  Wind down time - 6.5 hrs  <b>WEATHER CONDITIONS (373-2716)</b>  07:34: Wind NW @ 12 mph (gusts to 25 throughout day); temperature 57F, Barometric pressure 29.08, Humidity 53%.				<b>CASING SUMMARY</b> Bottom of 7 " OD casing (start of shift) = 92.74 ft. Bottom of 7" OD casing (end of shift) = 95.64 ft. Casing (7 in OD) stick up (end of shift) = 1.3 ft. Total Casing = 100.34 ft. (Constant = 3.4 ft.) <b>SAMPLE SUMMARY</b>  N/A		<b>PERSONNEL:</b> OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson (Optr/PIC) K Hartelius (HPT) K. Flower K. Jones/J. Beck (BSE)	
<b>TIME</b>		<b>DESCRIPTION OF OPERATIONS/REMARKS</b>					
FROM	TO						
07:00	07:56	Daily safety meeting. Discuss anticipated activities and weight of Dp (14 #/ft). No-questions or concerns (07:25). Equipment inspection and completed. Mr. Beck and Jones travel to BSE yard to decon DP..					
07:56	08:58	Trip Dp into boring. Add casing (95.34 + 5.0 = 100.34 ft) and Dp 96.13 ft + 5.0 = 101.13 ft). Set up hammer.					
08:58	09:02	Drive casing Blows dry 1 1/17/20/20. Depth of casing 100.34 - (3.4 + 1.3) = 95.64 ft bgs.					
09:02	09:06	Disconnect drive head.					
09:06		The TX Tank Farm is shut down due to wind. The wind is not expected to drop to within working parameters.					
		Area secured.					
	16:30	The BSE crew will work on documentation, slip table and casing decontamination.					
		Mr. Beck will take his 10 minute whole body today.					
		Mr. Jones has went home for the day.					
REPORT BY: DE Skoglie TITLE: Field Team Lead SIGNATURE: <u>David E Skoglie</u>				REVIEWED BY: MG Gardner TITLE: Project Manager SIGNATURE: <u>MG Gardner</u>			
				DATE: 8-15-02			

## Page 1 of 1

A-31

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 18		DATE: May 23, 2002 Thursday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting. Drive casing, Trip Dp and obtain sample S02046-16.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 8.3 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	95.51 ft	103.94 ft	
DOCUMENTED DOWNTIME  Down time due to HPT support 3 hrs..  WEATHER CONDITIONS (373-2716)  07:55: Wind E @ 5 mph; temperature 53F, Barometric pressure 29.45, Humidity 66%.				CASING SUMMARY Bottom of 7" OD casing (start of shift) = 95.51 ft. Bottom of 7" OD casing (end of shift) = 103.94 ft. Casing (7 in OD) stick up (end of shift) = 1.0 ft. Total Casing = 108.34 ft. (Constant = 3.4 ft.) SAMPLE SUMMARY S02046-16 (#13), 95.64 – 97.04 (11:45 hrs)		PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson (Optr/PIC) K Hartelius (HPT) K. Flower/R. Sharpe K. Young/F. Hall
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:40	Conduct daily safety meeting. Discuss anticipated activities. The HPT has training 8 – 11, no back-up was authorized. A weekly safety meeting was conducted. Topics included lifting, ladder work, noise monitoring (support generator), and posted signs.				
07:40	10:20	The manipulator hand was re-installed. A spacer was installed between the lower mast chain pulleys. An hydraulic line wrap was placed around the rotary head's hydraulic lines to help eliminate rubbing and catching on upsets.  NOTE: CHG safety (Ms. Pam Aardal and Mr. Bob Thacker) arrive onsite @ 08:30. A review and sign-off of the work package (including the AHA) allowed access to the work location. A review of the work location was discussed. Grinding was being conducted on the pulley spacer without a hot work permit. Work was stopped by D. Skoglie.				
10:20	10:35	The HPT arrived on location. HPT had attended required training.				
10:35	11:05	Trip the sampler/Dp into the boring (10:40). Set-up the hammer.				
11:05	11:08	Drive the sampler (95.64 – 97.04 ft). Sample number S02046-16, Blow count 5/5/2.				
11:08	12:00	Trip the sample out of the boring. Place in the barrel @ 11:45 hrs.				
12:00	12:30	Lunch The Oiler changes oil in the WINCO generator while on lunch break.				
12:30	13:37	Trip Dp in boring (13:10 hrs.). Add casing 5.0 ft (total 105.34 ft) and Dp 5.01 (total 106.15 ft.).				
13:37	13:47	Set-up head and drive casing S.U. 0.96 ft ( 105.34 – (3.4 + 0.96) = 100.98 ft bgs. BC 17/28/33/31/16.				
13:47	14:34	Disassemble head. Add casing 3 ft (108.34 ft) and Dp 3 ft (109.15 ft.). Set up head.				
14:34	14:36	Drive casing 108.34 – (3.4 + 1.0) = 103.94 ft bgs. BC 27/29/28. Secure site.				
14:36	16:30	Rebuild slip for 4.5 inch Dp. Samples shipped to PNNL laboratory.				
REPORT BY: DE Skoglie TITLE: Field Team Lead SIGNATURE: 				REVIEWED BY: MG Gardner TITLE: Project Manager DATE: 8-15-02 SIGNATURE: 		





# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 18Page 2 of 2

Sample No. 502046 Sample Tracking No. 16  
 Target Depth 96 to 97  
 (1) 3.4 top of rig floor above ground  
 (2) 4.7 casing stickup above ground  
 Csg Total (3) 100.34 - Stickup (2) 4.7 = TD (4) 95.64  
 Does not include drive head  
 Backpull stickup (2+5) 4.83  
 Sample depth (4) 95.64 to (4+6) 97.04 (1.4)

### Blow Count

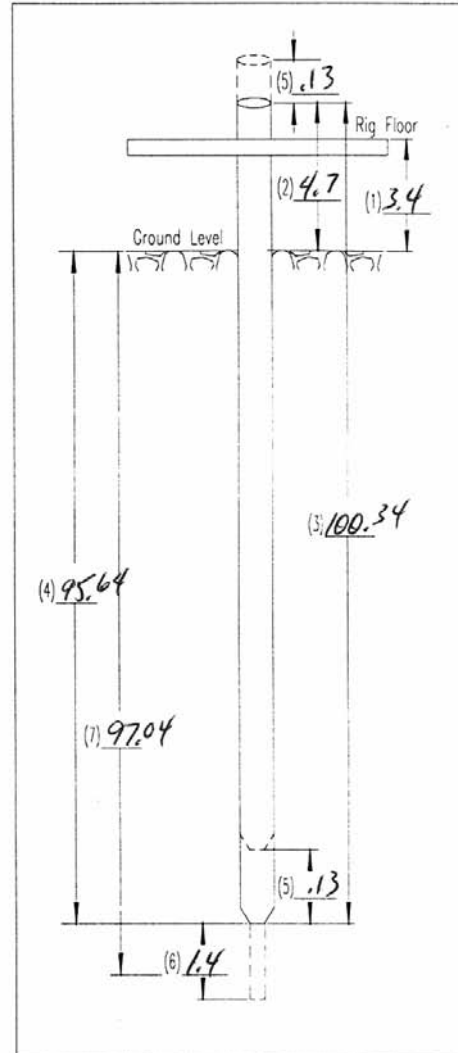
	.5 ft	1 ft	<u>1.4 ft</u> <del>DEA</del>
Start Time <u>11:05</u>	<u>5</u>	<u>5</u>	<u>2</u>
End Time <u>11:08</u>			

Estimated Recovery: Full

### Remarks:

Sample in barrel @ 11:45 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6





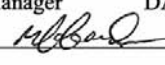
PREPARED BY (Please print):

TITLE:

DATE: 05/23/02SIGNATURE: [Signature]REVIEWED BY (Please print): MGBARRISTERTITLE: Manager

DATE:

SIGNATURE: [Signature]8-15-02

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 3
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 19		DATE: May 28, 2002 Tuesday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily/Weekly Safety meeting. Drive casing, Trip Dp and obtain sample S02046-17 and S02046-18.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 7.44 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoc, 7.5" OD	103.94 ft	109.66	END: 111.38 ft
DOCUMENTED DOWNTIME			CASING SUMMARY			Personnel: Operator - KC Olson Dr. Curry / DE Morris W.A. Lic. #1217 Other - DE Skoglie K Johnson - optr-pic K Hartelius - HPT K Flower / R. S. Herge K Young / F. Hall
N/A			Bottom of 7" OD casing (start of shift) = 103.94 ft.			
			Bottom of 7" OD casing (end of shift) = 109.66 ft.			
			Casing (7 in OD) stick up (end of shift) = 1.03 ft.			
			Total Casing = 114.34 ft. (Constant 3.4 ft.)			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			
07:23: Wind W @ 10 mph (gusts to 15); temperature 63F, Barometric pressure 29.15, Humidity 62%.			Sample: S02046-17 (#14) 103.94 – 105.36 @ 10:15			
			Sample: S02046-18 (#15) 109.91 – 111.38 @ 15:20			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:30	Sign in Work Package. Conduct equipment inspection and fuel power unit. No deficiencies on equipment.				
07:30	07:54	Conduct daily safety meeting and weekly safety meeting. Safety topic is Hot Work Permit and process.				
07:54	09:28	Back pull casing 0.25 ft. Casing @ 103.69 ft. bgs. Trip Dp from boring (08:54 hrs). Trip sampler in boring.				
09:28	10:15	Set up hammer. Drive sample 103.94 – 105.36 ft. (S02046-17) Blows 3/3/2. (09:29 – 0930). Sample in drum @ 10:15 hrs. NOTE: A slip spacer may be in the bottom of this sample.				
10:15	10:42	Back pull casing (3 ft) 10:33 hrs. Water break 10:33 – 10:42.				
10:42	11:37	Trip Dp in boring (11:25 hrs). Add casing 5.0 ft (total 110.34) and Dp 5.0 ft (111.15 ft).				
11:37	12:00	Set up drive head/hammer. Drive casing (11:44 – 11:49) to a depth of 105.84 ft bgs. Blows 16/18. Remove drive head.				
12:00	12:30	Lunch				
12:30	13:04	The drive head pin will not go through hole in casing. The drive head was switched out. The hole will be enlarged this evening. Add casing 4.0 ft (total 114.34 ft) and Dp 4.0 ft (total 115.15 ft).				
13:04	13:20	Set up head. Drive casing to 109.91 ft bgs (114.34 – [3.4 + 1.03] = 109.91 ft (13:09). BC 25/31/32/33. Dismantle drive head.				
13:20	13:57	Back pull casing 0.25 ft. Casing depth 109.66 ft. bgs. Trip out Dp/drive tip.				
13:57	14:31	Trip sampler in boring. Set-up hammer.				
14:31	14:33	Drive sample 109.91 – 111.38 (1.47 ft). Blows 5/4/3. Sample in drum @ 15:20 hrs. Sample pulled out of formation hard.				
14:33	15:33	Sampler in drum @ 15:20 hrs. Ship samples to PNNL laboratory. Back pull casing (4 ft).				
15:33	16:30	Secure site. Load drive heads to enlarge pin holes.				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		





# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 19Page 2 of 3Sample No. 502046 Sample Tracking No. 17Target Depth 104 to 105(1) 3.4 top of rig floor above ground(2) 4.4 casing stickup above groundCsg Total (3) 108.34 - Stickup (2) 4.4 = TD (4) 103.94

Does not include drive head

Backpull stickup (2+5) 4.65Sample depth (4) 103.94 to (4+6) 105.36 (1.42)

### Blow Count

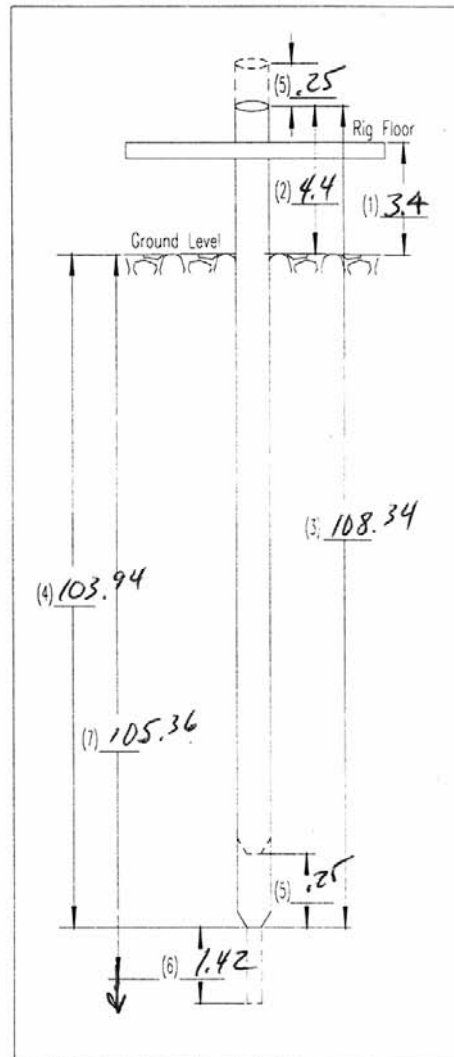
	.5 ft	1 ft	<u>1.42 FT</u>
Start Time			
<u>0929</u>	<u>3</u>	<u>3</u>	<u>2</u>
End Time			
<u>0930</u>			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 10:15 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

SIGNATURE: David E. ShoglerDATE: 5/28/02REVIEWED BY (Please print): MC GARLANDTITLE: ManagerSIGNATURE: McGarland

DATE:

8-15-02


**Duratek Federal Services, Inc., Northwest Operations**
**SAMPLE FORM**
FAR No. 19Page 3 of 3

Sample No. 502046 Sample Tracking No. 18  
 Target Depth 110 to 111  
 (1) 3.4 top of rig floor above ground  
 (2) 4.43 casing stickup above ground  
 Csg Total (3) 114.34 - Stickup (2) 4.43 = TD (4) 109.91  
 Does not include drive head  
 Backpull stickup (2+5) 4.68  
 Sample depth (4) 109.91 to (4+6) 111.38 (1.47)

**Blow Count**

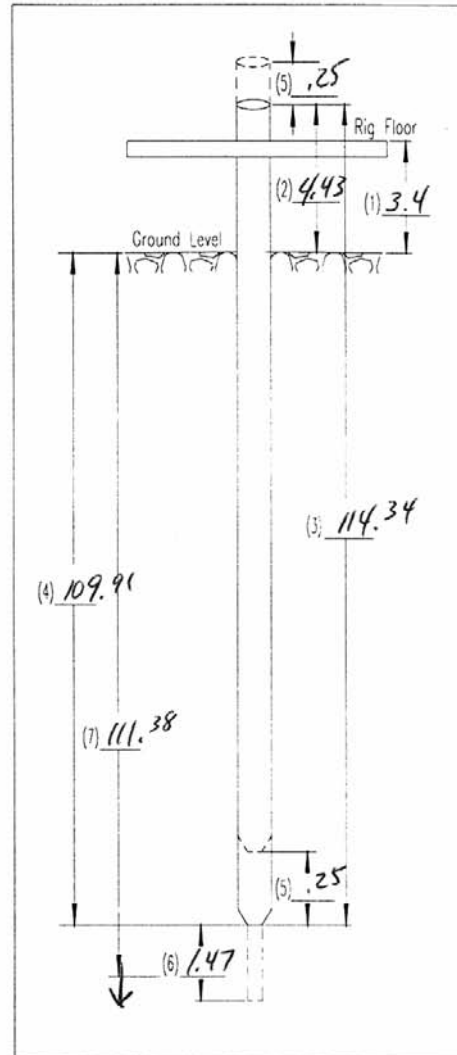
	.5 ft	1 ft	<u>1.47 ft</u>
Start Time			
<u>14:31</u>	<u>5</u>	<u>4</u>	<u>3</u>
End Time			
<u>14:33</u>			

Estimated Recovery: Full

Remarks:

Sample in bbl @ 15:20 hrs.

- 1 = Top of rig floor above ground  
 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU  
 3 = Total csg length  
 4 = Depth of csg = Total Depth (TD)  
 Total csg - SU<sup>(2)</sup> = TD  
 5 = Casing back pull  
 6 = Sampler drive distance  
 7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

DATE: 5/28/02  
 SIGNATURE: David S. Shoglie


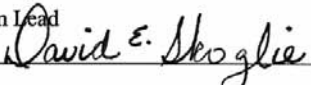

REVIEWED BY (Please print): MBGARDNERTITLE: Mohay

DATE:

SIGNATURE: MBGARDNER

8-15-02



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 21		DATE: May 30, 2002 Thursday
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting. Dive casing and sample (S02046-19). Casing/sample driving very hard.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 3.82 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	109.66 ft	114.04 ft	
DOCUMENTED DOWNTIME			CASING SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D Skoglie K Johnson (Optr/PIC) K Hartelius/Andy (HPT) K. Flower/S. Snook K. Young/F. Hall
N/A			Bottom of 7" OD casing (start of shift) = 109.66 ft.			
			Bottom of 7" OD casing (end of shift) = 114.04 ft.			
			Casing (7 in OD) stick up (end of shift) = 2.9			
			Total Casing = 120.34 ft. (Constant = 3.4 ft.)			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			
07:27: Wind SE @ 11 mph (gusts to 15); temperature 60F, Barometric pressure 29.31, Humidity 59%.			Sample: S02046-19 (#16) (113.77 – 115.2) @ 12:10			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:39	Conduct daily safety meeting and discuss anticipated activities. No questions or concerns (07:27) Conduct equipment inspection, no deficiencies noted.				
07:39	08:08	Trip Dp/tip into boring.				
08:08	08:25	Add casing 5.0 (total 115.34 ft) and Dp 5.01 (total 116.16 ft) 08:20. Set-up hammer.				
08:25	08:47	Drive casing S.U. 0.98 = 110.96 ft bgs (08:28). BC 20. Add casing 3.0 (total 118.34 ft) and Dp 3.0 (total 119.16 ft).				
08:47	09:03	Set-up hammer and Drive casing . 118.34 – (3.4 + 1.17) = 113.77 ft bgs. Back pull 0.17 ft. Blows 22/50/147.				
09:03	10:15	Trip Dp out of boring (10:05). Break and call on BSE personnel physicals.				
10:15	11:10	Trip in sampler (10:59). Set-up hammer. Drive sample 113.77 – 115.2 ft (11:03 – 11:10). Blows 13/21/36 half throttle).				
11:10	11:29	Grease mast slid (metal shavings are being generated).				
11:29	12:10	Trip sample out of boring. Back pull first ft with jacks. Sample in drum @ 12:10 hrs.				
12:10	12:20	Load sample and drum into sample truck. Sample will be shipped to PNNL laboratory.				
12:20	12:59	lunch				
12:59	13:43	Back pull and remove 3 ft section of casing. Casing is pulling @ 1,200 psig. Wrench slips are slipping.				
13:43	14:33	Trip Dp into boring.				
14:33	15:30	Add casing 5.0 (total 120.34) and Dp .50 (total 121.16 ft). Drive casing to a depth of 114.04 ft bgs. Casing is driving very hard (60 blows/3 inches). Slips are removed from the hydraulic jacks for cleaning.				
NOTE 1: Mr. Sydnor was contacted (REFUSAL 100 – 120 blows per foot is considered refusal).						
15:30	16:30	Area secured. Slips cleaned.				
REPORT BY: DE Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		



# Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 21Page 2 of 2

Sample No. 502046 Sample Tracking No. 19  
 Target Depth 114 to 115  
 (1) 3.4 top of rig floor above ground  
 (2) 4.57 casing stickup above ground  
 Csg Total (3) 118.34 - Stickup (2) 4.57 = TD (4) 113.77  
 Does not include drive head  
 Backpull stickup (2+5) 4.74  
 Sample depth (4) 113.77 to (4+6) 115.2 (1.43)

### Blow Count

	.5 ft	1 ft	<u>1.43 ft</u>
Start Time			
<u>11:03</u>	<u>13</u>	<u>21</u>	<u>36</u>
End Time			
<u>11:10</u>			

Estimated Recovery:

Remarks:

SAMPLE in bbl @ 12:10 hrs.

- 1 = Top of rig floor above ground
- 2 = Stickup of csg above ground 1 + measure from floor to top csg = SU
- 3 = Total csg length
- 4 = Depth of csg = Total Depth (TD)  
Total csg - SU<sup>(2)</sup> = TD
- 5 = Casing back pull
- 6 = Sampler drive distance
- 7 = Total depth of driven sample = 4 + 6

PREPARED BY (Please print):

TITLE:

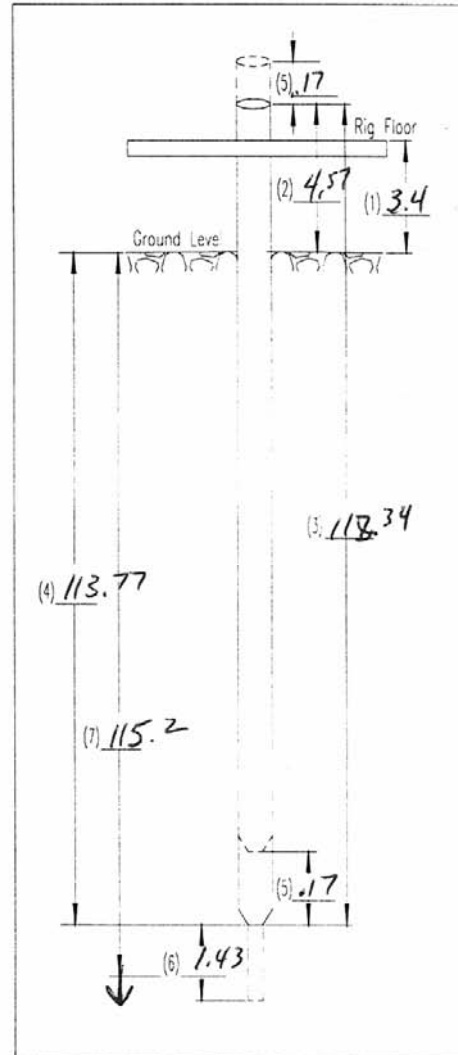
DATE: 5/30/02  
 SIGNATURE: David E. Shoglin


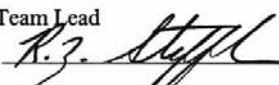
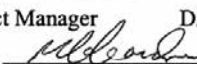
REVIEWED BY (Please print): MG BARNSERTITLE: Manager

DATE:


SIGNATURE: [Signature]

8-15-02



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 22		DATE: May 31, 2002 Friday
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily equipment inspection. Daily Safety meeting. Attempt sample (S02046-20). Casing/sample driving very hard.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1530 CONTRACTOR TIME: 0.5 TOTAL TIME: 8.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	114.04 ft	114.04	START: 115.2 ft  END: 114.47 ft (fill 0.73 ft.)
DOCUMENTED DOWNTIME			CASING SUMMARY			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: RZ Steffler S. Snook/K Johnson (Optr/PIC) Andy Wagner (HPT) K. Flower K. Young/F. Hall (Operators)
1 hr PIC had to leave site.			Bottom of 7" OD casing (start of shift) = 114.04 ft.			
0.5 hr HPT			Bottom of 7" OD casing (end of shift) = 114.04 ft.			
WEATHER CONDITIONS (373-2716)			Casing (7 in OD) stick up (end of shift) = 0.9 ft.			
10:40: Wind NW @ 4-8 mph, temperature 71F, Barometric pressure 29.24, Humidity 28%.			Total Casing = 118.34 ft. (Constant = 3.4 ft.)			
			SAMPLE SUMMARY			
			None taken. Ready to sample.			
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	08:45	Conduct daily safety meeting and discuss anticipated activities. No questions or concerns. Conduct equipment inspection and performed maintenance on rig.				
08:45	08:55	Mr. Sickie received deck training.				
08:55	09:05	Tailgate meeting. No concerns.				
09:05	09:12	Attempted to drive casing. 17 blows per 1/2 inch. Ken Flowers determined that we had refusal. Casing depth = 114.24 after attempt (120.34 - [3.4 + 2.7])				
09:12	10:30	Phone conversations with customer. Another sample to be attempted. Discussion of feasibility of pulling sample. Remove sections of pipe for back pull and tag.				
10:30	11:30	Job shut down. PIC had to leave the site.				
11:30	12:30	No HPT on site to continue working. Lunch 11:30 - 12:00				
12:30	13:00	Debate feasibility of having enough time to pull a sample. Not enough time to trip out, trip in and pull the sample.				
13:00	13:43	Pulled 5 ft. casing and replaced with 3 footer. (Outer) 120.34 - 5.0 = 115.34 + 3.0 = 118.34 (Inner) 121.16 - 5.0 = 116.16 + 3.0 = 119.16, then drove casing to refusal 114.24 ft bgs.. (20 Blows) Stick up = .9 feet. NOTE: New stick up is after the casing was pulled back (.20 ft.) for sampling purposes. Casing depth at 114.04 ft bgs.				
13:43	14:30	Pulled inner casing.				
14:30	14:35	Bottom of hole tag (steel tape) 118.72 ft (116.5 + 2.27 - (3.4 + 0.9) = 114.47 ft bgs. Bore-hole ready for next sample. Open hole 0.4 ft.				
14:35	14:45	Site secured.				
REPORT BY: RZ Steffler				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		



		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 2 <i>ms</i>
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 23		DATE: June 03, 2002 Monday
CONTRACT NUMBER: 8248-55		START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily equipment inspection. Daily Safety meeting. Sample (S02046-20 [114.47 – 115.89 ft]). Total depth 115.89 ft bgs.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
7.0 " OD	NA	CS	Shoe, 7.5 " OD	114.04 ft	114.04 ft	
DOCUMENTED DOWNTIME			CASING SUMMARY			PERSONNEL:
N/A			Bottom of 7 " OD casing (start of shift) = 114.04 ft.			
			Bottom of 7" OD casing (end of shift) = 114.04 ft.			
			Casing (7 in OD) stick up (end of shift) = 0.9 ft.			
			Total Casing = 118.34 ft. (Constant 3.4 ft.)			
WEATHER CONDITIONS (373-2716)			SAMPLE SUMMARY			OTHER: D.Skoglie
07:40: Wind SW @ 5- 15 mph , temperature 65F, Barometric pressure 29.24, Humidity 28%.			S02046-20 (114.47 – 115.89 ft) Blows 6/11/20			R. Sharpe/K Johnson (Optr/PIC)
						K. Hartilius (HPT)
						K. Flower
						K. Young/F. Hall (Operators)
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:35	Conduct a daily safety meeting. Also, discussed anticipated activities for the day. Last weeks safety surveillance was reviewed.				
07:35		Conduct equipment maintenance and inspection.				
	08:23	Tag bottom of hole 116.5 + 2.27 (correction) – (3.4 + 0.9) = 114.47 ft bgs.				
08:23	08:59	Trip sampler/ Dp into boring (08:58). Set-up hammer.				
08:59	09:25	Drive sample 1.42 ft (114.47 – 115.89 ft) @ 09:04. Blows 6/11/20 (half throttle). Sampler is very tight, utilize casing jacks and rotary head to pull sampler loose (utilize a centralizer to eliminate slippage).				
09:25	10:00	Trip Dp/sampler out of bore hole, in barrel @ 10:00 hrs.				
10:00	10:10	Discussion with Mr. Sydnor regarding bore hole depth. Total depth has been reached.				
10:10	10:50	Discussion on planned work.				
10:50	11:32	Trip Dp into bore hole for trip out in 5 ft lengths.				
11:32	12:02	Lunch Sample is shipped to the PNNL laboratory.				
12:02	14:58	Trip Dp out of boring (breaking out 5 ft joints). Move drill pipe and equipment components to staging area. Ready site for geophysical logging on June 04.				
14:58	16:30	Mobilize the Geophysical logging truck into the TX Tank Farm and set-up.				
		Mr. Meisner will be aced tonight. Area secured.				
REPORT BY: D.E. Skoglie		REVIEWED BY: MG Gardner				
TITLE: Field Team Lead		TITLE: Project Manager				
SIGNATURE: <i>David E. Skoglie</i>		DATE: 8-15-02				
		SIGNATURE: <i>MG Gardner</i>				



## Duratek Federal Services, Inc., Northwest Operations

## SAMPLE FORM

FAR No. 23Page 2 of 2Sample No. 502046 Sample Tracking No. 20Target Depth N/A to N/A(1) 3.4 top of rig floor above ground(2) 3.87 casing stickup above groundCsg Total (3) 118.34 - Stickup (2) 3.87 = TD (4) 114.47

Does not include drive head

Backpull stickup (2+5) 4.12Sample depth (4) 114.47 to (4+6) 115.89 (1.42)

## Blow Count

1.42 ft

	.5 ft	1 ft	<u>1.5 ft</u> <u>0.81</u>
Start Time	<u>6</u>	<u>11</u>	<u>20</u>
End Time			

Estimated Recovery: Full

## Remarks:

1) SAMPLE in bbl @

2) Due to refusal a sample was taken at the end of the bore hole.

1 = Top of rig floor above ground

2 = Stickup of csg above ground 1 + measure from floor to top csg = SU

3 = Total csg length

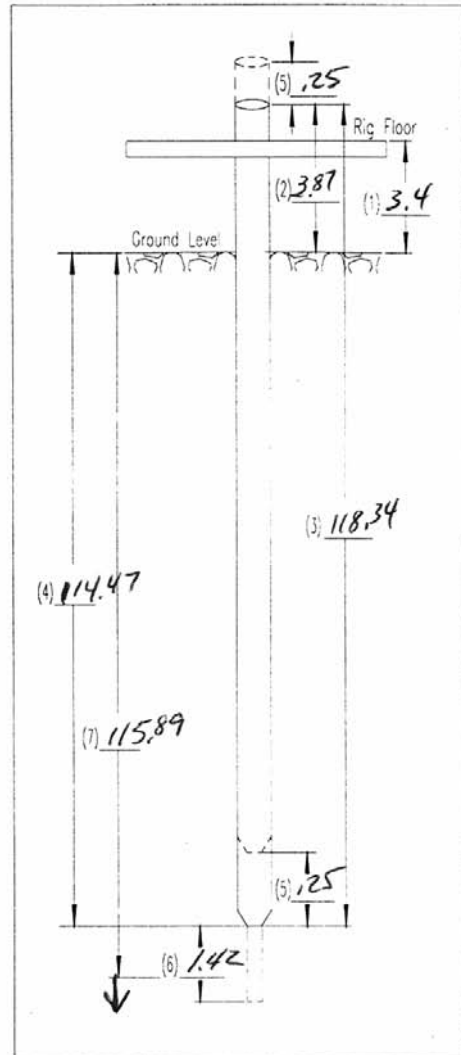
4 = Depth of csg = Total Depth (TD)

Total csg - SU<sup>(2)</sup> = TD

5 = Casing back pull

6 = Sampler drive distance

7 = Total depth of driven sample = 4 + 6



PREPARED BY (Please print):

TITLE:

SIGNATURE: David E. ShoglieDATE: 6/03/02REVIEWED BY (Please print): MB BARNERTITLE: ManagerSIGNATURE: MB BARNER



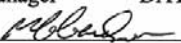
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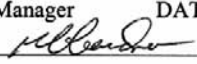
8-15-02



## Page 1 of 1

SIGNATURE:




		<b>Duratek Federal Services, Inc., Northwest Operations</b>						
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>								Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 25		DATE: June 05, 2002 Wednesday		
CONTRACT NUMBER: 8248-55			START CARD NO: S00630			RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily Safety meeting. Downhole logging of borehole and bentonite staging.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West		
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.				
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700		
CASING SIZE		SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	END TIME: 1630	
7.0 " OD		NA	CS	Shoe, 7.5 " OD	114.04 ft	114.04	CONTRACTOR TIME: 0.5	
							TOTAL TIME: 9.5	
DOCUMENTED DOWNTIME				CASING SUMMARY		PERSONNEL:		
N/A				Bottom of 7 " OD casing (start of shift) = 114.04 ft.		OPERATOR: KC Olson		
				Bottom of 7" OD casing (end of shift) = 114.04 ft.		DL Curry/DE Morris		
				Casing (7 in OD) stick up (end of shift) = 0.9 ft.		WA LICENSE #: 1217		
WEATHER CONDITIONS (373-2716)				SAMPLE SUMMARY		OTHER: D. Skoglie, K.Reynolds		
15:34: Wind W @ 15 mph (gusts to 23 mph), temperature 84F, Barometric pressure 29.24, Humidity 19%.				No samples taken. Geophysical logging only.		R. Sharpe/K Johnson (Optr/PIC)		
						S. Snook (Optr)		
						K. Hartilius (HPT)		
						J. Meisner (Logger)		
TIME		DESCRIPTION OF OPERATIONS/REMARKS						
FROM	TO							
07:00	07:35	Conduct a daily safety meeting. Discussed anticipated activities for the day. Depth has been reached. No drilling to take place. Geophysical logging only.						
07:35	15:30	Calibrated logging tool. Logged well with the 70% high purity germanium detector to a depth of 97.0 ft. Additional logging will be conducted tomorrow.						
		Mr. Brown (DOE) site representative has raised the issue of the gate being opened and not guarded. A Chain and warning signs are posted at the gate. If the gate cannot be left opened, a safety concern will be issued by on-sight personnel.						
REPORT BY: D.E. Skoglie		REVIEWED BY: MG Gardner						
TITLE: Field Team Lead		TITLE: Project Manager						
SIGNATURE: 		DATE: 8-15-02						
		SIGNATURE: 						

		<b>Duratek Federal Services, Inc., Northwest Operations</b>					
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>							Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 26		DATE: June 06, 2002 Thursday	
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily Safety meeting. Downhole logging of borehole and bentonite staging.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West	
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.			
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH: START: 115.89 ft  END: 115.89 ft		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5	
CASING SIZE 7.0" OD	SET-AT DEPTH NA	TYPE CASING CS	DRIVE POINT DIMENSION Shoe, 7.5" OD	START DEPTH 114.04 ft	END DEPTH 114.04 ft		
DOCUMENTED DOWNTIME  N/A			CASING SUMMARY Bottom of 7" OD casing (start of shift) = 114.04 ft. Bottom of 7" OD casing (end of shift) = 114.04 ft. Casing (7 in OD) stick up (end of shift) = 0.9 ft.			PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D. Skoglie, K. Reynolds R. Sharpe/ (Optr/PIC) S. Snook (Optr) K. Hartilius (HPT) J. Meisner (Logger)	
WEATHER CONDITIONS (373-2716)  08:05: Wind W @ 11-17 mph, temperature 60F, Barometric pressure 29.37, Humidity 27%.			SAMPLE SUMMARY  No samples taken. Geophysical logging only.				
TIME FROM TO		DESCRIPTION OF OPERATIONS/REMARKS					
07:00 07:50		Conduct a daily safety and weekly safety meeting. Discussed anticipated activities for the day. Weekly safety topic is Heat Stress. Also, discussed was WAC 173-160-460 (well decommissioning) requirements.					
07:50 08:25		No work package on-site. Mr. Larson is reviewing. Mr. Sharpe picked up Work Package. Work package is released and on-site.					
08:25 13:00		Calibrating logging tool. Logged well with the 70% high purity germanium detector to total depth.					
13:00 14:30		CHG Operations Time Out meeting was held by Mr. Harold Syndor.					
14:30 16:30		Complete 4.5 X 7.0 sub for back pulling operations. Complete documentation.					
		Area secured.					
REPORT BY: D.E. Skoglie TITLE: Field Team Lead SIGNATURE: 				REVIEWED BY: MG Gardner TITLE: Project Manager DATE: 8-15-02 SIGNATURE: 			



## Page 1 of 1




SIGNATURE:



		<b>Duratek Federal Services, Inc., Northwest Operations</b>						
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>								Page 1 of 2
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 29		DATE: June 12, 2002 Wednesday		
CONTRACT NUMBER: 8248-55			START CARD NO: S00630			RIG MODEL/NO: SIMCO 5000 (Rig 106)		
PURPOSE: Daily and Weekly Safety meeting. Decommissioning Operations.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West		
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.				
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700		
CASING SIZE		SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	END TIME: 1630	
7.0 " OD		NA	CS	Shoe, 7.5 " OD	114.04 ft	29.89 ft	CONTRACTOR TIME: 0.5	
				END: 30.6 ft		TOTAL TIME: 9.5		
DOCUMENTED DOWNTIME				CASING SUMMARY		PERSONNEL:		
N/A				Bottom of 7 " OD casing (start of shift) = 114.04 ft.		OPERATOR: KC Olson		
				Bottom of 7" OD casing (end of shift) = 29.89 ft.		DL Curry/DE Morris		
				Casing (7 in OD) stick up (end of shift) = 2.1 ft.		WA LICENSE #: 1217		
WEATHER CONDITIONS (373-2716)				SAMPLE SUMMARY		OTHER: D. Skoglie, K Flower		
09:52: Wind NE @ 4 mph, temperature 76F, Barometric pressure 29.34, Humidity 40%.				N/A		R. Sharpe/S. Snook (Opnr)		
						K. Johnson (PIC)		
						K. Hartilius (HPT)		
TIME		DESCRIPTION OF OPERATIONS/REMARKS						
FROM	TO							
07:00	07:35	The Work Package is released to the PIC.						
07:35	07:54	A daily Safety meeting was held to discuss anticipated daily activities (decommission bore-hole). Also, the weekly safety meeting was conducted (Ergonomics and Back Safety).						
07:54	08:45	Conduct equipment inspection and maintenance. No equipment deficiencies.						
08:45	09:00	Pull and remove casing (3 ft). Casing broke hard. Casing @ ????. Tag fill @ 115.6 ft bgs (118.5 - [3.4 + 1.2]). Add 2 sks bentonite crumbles. Tag 114.5 - (3.4 + 2.2) = 111.6 ft bgs.						
09:00	09:20	Pull and remove casing (#37) <500 psig jacking pressure.. Casing @ 104.84 ft bgs (110.34 - [3.4 + 2.1]). Tag crumbles 114.3 + 2.7 - (3.4 + 2.1) = 111.5 ft bgs. Add 3 sks bentonite. Tag fill 108 + 2.7 - (3.4 + 2.1) = 105.2 ft bgs.						
09:20	09:46	Pull and remove casing (#35). Casing @ 105.34 - (3.4 + 1.9) = 100.04 ft bgs. Tag fill @ 110.2 - (3.4 + 1.9) = 104.9 ft bgs. Add bentonite (2 sks) tag @ 100.9 ft bgs (106.2 - (3.4 + 1.9)).						
09:46	10:08	Break						
10:08	10:21	Pull and remove casing (#33). Casing @ 94.87 ft bgs (100.34 - [3.4 + 2.07]). Tag fill @ 106.3 - (3.4 + 2.07) = 100.83 ft bgs. Add 2.5 sks bentonite. Tag fill @ 101.0 - (3.4 + 2.07) = 95.53 ft bgs.						
10:21	10:40	Pull and remove casing #32. Casing @ 100.8 - (3.4 + 1.6) = 95.8 ft bgs. Tag fill @ 95.3 - (3.4 + 1.6) = 90.3 ft bgs. Add 2.5 sks bentonite. Tag fill @ 95.75 - (3.4 + 1.6) = 90.75 ft bgs.						
10:40	10:59	Pull and remove casing # 30. Casing @ 90.34 - (3.4 + 1.7) = 85.24 ft bgs. Tag fill 95.65 - (3.4 + 1.7) = 90.55 ft bgs. Add 2.5 sks bentonite. Tag fill 90.75 - (3.4 - 1.7) = 85.65 ft bgs.						
REPORT BY: D.E. Skoglie				REVIEWED BY: MG Gardner				
TITLE: Field Team Lead				TITLE: Project Manager				
SIGNATURE: 				DATE: 8-15-02				
				SIGNATURE: 				



<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b> <span style="float: right;">Page 2 of 2</span>		
DATE: June 12, 2002		WELL NUMBER: C3832
CONTINUATION OF REPORT NUMBER: 29		
TIME		DESCRIPTION OF OPERATIONS/REMARKS
FROM	TO	
10:59	11:13	Pull and remove casing #29 (jacking pressure 200 psig.. Casing @ 85.34 – (3.4 + 1.6) = 80.34 ft bgs. 90.6 – (3.4 + 1.6) = 85.6 ft bgs. Add 2.5 sks bentonite. Tag fill @ 85.55 – (3.4 + 1.6) = 80.25 ft bgs.
11:13	11:40	Pull and remove casing # 26. Casing @ 80.34 – (3.4 + 2.6) = 74.34 ft bgs. Tag fill 86.55 – (3.4 + 2.6) = 80.75 ft bgs. Add 2.5 sks bentonite. Tag fill 81.9 – (3.4 – 1.7) = 75.9 ft bgs.
11:40	12:20	Lunch
12:20	12:47	Operator moves casing to staging area. Health physics has surveyed with no radiological contamination. Pull and remove casing #24. Casing @ 75.35 – (3.4 + 1.9) = 70.05 ft bgs. Fill tag 81.15 – (3.4 + 1.9) = 77.85 ft bgs. Add 2.5 sks bentonite. Tag fill @ 75.65 – (3.4 + 1.9) = 70.35 ft bgs.
12:47	12:58	Pull and remove casing #23. Casing @ 70.36 – (3.4 + 2.1) = 64.86 ft bgs. Fill tag 75.8 – (3.4 + 2.1) = 70.4 ft bgs. Add 2.5 sks bentonite. Tag fill @ 70.7 – (3.4 + 2.1) = 65.2 ft bgs.
12:58	13:12	Pull and remove casing #21 (950 psig jacking pressure). Casing @ 65.36 – (3.4 + 2.05) = 59.91 ft bgs. Tag fill 70.65 – (3.4 + 2.05) = 65.2 ft bgs. Add 2.5 sks bentonite. Tag fill @ 65.7 – (3.4 + 2.05) = 60.25 ft bgs.
13:12	13:29	Pull and remove casing #19 (600 psig jacking pressure). Casing @ 60.37 – (3.4 + 2.15) = 54.82 ft bgs. Tag fill 65.82 – (3.4 + 2.15) = 60.3 ft bgs. Add 2.5 sks bentonite. Tag fill @ 60.8 – (3.4 + 2.15) = 55.25 ft bgs. NOTE: Tight connection 65ft pin/60ft box.
13:29	13:42	Pull and remove casing #17. Casing @ 55.38 – (3.4 + 2.25) = 49.73 ft bgs. Fill tag 60.9 – (3.4 + 2.25) = 55.25 ft bgs. Add 2.5 sks bentonite. Tag fill @ 56.1 – (3.4 + 2.25) = 50.45 ft bgs.
13:42	13:55	Pull and remove casing #15. Casing @ 50.39 – (3.4 + 2.0) = 44.99 ft bgs. Fill tag 55.5 – (3.4 + 2.0) = 52.1 ft bgs. Add 2.5 sks bentonite. Tag fill @ 50.65 – (3.4 + 2.0) = 45.25 ft bgs.
13:55	14:15	Break WBGT reading from weather station 76 F.
14:15	14:33	Pull and remove casing #14. Casing @ 45.39 – (3.4 + 1.8) = 40.19 ft bgs. Fill tag 50.6 – (3.4 + 1.8) = 47.4 ft bgs. Add 2.5 sks bentonite. Tag fill @ 45.7 – (3.4 + 1.8) = 40.5 ft bgs.
14:33	14:46	Pull and remove casing #12. Casing @ 40.39 – (3.4 + 2.2) = 34.79 ft bgs. Fill tag 46.05 – (3.4 + 2.2) = 40.45 ft bgs. Add 2.5 sks bentonite. Tag fill @ 40.9 – (3.4 + 2.2) = 35.3 ft bgs.
14:46	15:10	Pull and remove casing #11. Casing @ 35.39 – (3.4 + 2.1) = 29.89 ft bgs. Fill tag 40.7 – (3.4 + 2.1) = 35.3 ft bgs. Add 2.5 sks bentonite. Tag fill @ 36.1 – (3.4 + 2.1) = 30.6 ft bgs.
15:10	15:30	Move pipe to pallet. Health physics surveyed with no radiological contamination noted. Bentonite sacks surveyed from TX Tank Farm. Sacks will be disposed of in garbadge.
15:30	16:30	Area secured. Documentation completed.
REPORT BY: D.E. Skoglie TITLE: Field Team Lead SIGNATURE: 		REVIEWED BY: MG Gardner TITLE: Project Manager DATE: 8-15-02 SIGNATURE: 

		<b>Duratek Federal Services, Inc., Northwest Operations</b>				
<b>DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD</b>						Page 1 of 1
WELL I.D.: C3832		WELL NUMBER: N/A		REPORT NUMBER: 30		DATE: June 13, 2002 Thursday
CONTRACT NUMBER: 8248-55			START CARD NO: S00630		RIG MODEL/NO: SIMCO 5000 (Rig 106)	
PURPOSE: Daily and Safety meeting. Decommissioning Operations.				REFERENCE: DFSNW-DOW-006, Rev. 0		LOCATION: TX Tank Farm, 200 West
REFERENCE MEASURING POINT: Steel Plate				TOTAL SHIFT FOOTAGE: 0.0 ft.		
CONSTRUCTION DESCRIPTION: N/A				BORING DEPTH:		START TIME: 0700 END TIME: 1630 CONTRACTOR TIME: 0.5 TOTAL TIME: 9.5
CASING SIZE	SET-AT DEPTH	TYPE CASING	DRIVE POINT DIMENSION	START DEPTH	END DEPTH	
7.0" OD	NA	CS	Shoe, 7.5" OD	29.89 ft	0.0 ft	
DOCUMENTED DOWNTIME				CASING SUMMARY		PERSONNEL: OPERATOR: KC Olson DL Curry/DE Morris WA LICENSE #: 1217 OTHER: D. Skoglie, K Flower R. Sharpe/S. Snook (Optr) K. Johnson (PIC) K. Hartilius (HPT)
N/A				Bottom of 7" OD casing (start of shift) = 29.89 ft.		
				Bottom of 7" OD casing (end of shift) = 0.0 ft.		
				Casing (7 in OD) stick up (end of shift) = 0.0 ft.		
WEATHER CONDITIONS (373-2716)				SAMPLE SUMMARY		
10:28: Wind N @ 6 mph, temperature 80F, Barometric pressure 29.31, Humidity 39%.				N/A		
TIME		DESCRIPTION OF OPERATIONS/REMARKS				
FROM	TO					
07:00	07:42	The Work Package is released to the PIC. Conduct daily safety meeting, discussing anticipated activities. Complete equipment inspection, no deficiencies. Health physics has picked up calibrated instruments.				
07:42	08:31	Pull casing to 3.1 S.U. above the work deck. Tag bottom @ 36.9 - (3.4 + 3.1) = 30.4 ft bgs. (08:17). Pull and remove casing (#10). Casing broke hard. Casing @ 24.88 ft bgs (30.39 - [3.4 + 2.15]). Tag fill @ 35.3 - (3.4 + 2.15). Add 2.5 sks bentonite crumbles. Tag 31.5 - (3.4 + 2.15) = 25.95 ft bgs.				
08:31	08:44	Pull and remove casing (#8). Jacking pressure @ 250 psig. Casing @ 19.79 ft bgs (25.39 - [3.4 + 2.2]). Tag crumbles 31.55 - (3.4 + 2.2) = 25.95 ft bgs. Add 2.5 sks bentonite. Tag fill 26.9 - (3.4 + 2.2) = 21.25 ft bgs.				
08:44	09:01	Pull and remove casing (#7). Casing @ 20.41 - (3.4 + 2.15) = 14.86 ft bgs. Tag fill @ 26.5 - (3.4 + 2.15) = 20.95 ft bgs. Add bentonite (3 sks) tag @ 13.75 ft bgs (19.3 - (3.4 + 2.15)). 1.11 ft crumbles inside casing.				
09:01	09:14	Pull and remove casing (#6). Casing @ 9.92 ft bgs (15.42 - [3.4 + 2.1]). Tag fill @ 18.5 - (3.4 + 2.1) = 13.0 ft bgs. Add 2 sks bentonite. Tag fill @ 15.95 - (3.4 + 2.1) = 10.45 ft bgs.				
09:14	09:33	Pull and remove casing #5. Casing @ 10.42 - (3.4 + 2.0) = 5.02 ft bgs. Tag fill @ 15.8 - (3.4 + 2.0) = 10.4 ft bgs. Add 2 sks bentonite. Tag fill @ 11.6 - (3.4 + 2.0) = 6.2 ft bgs.				
09:33	09:47	Pull and remove casing #4. Casing @ 5.44 - (3.4 + 1.85) = 0.19 ft bgs. Tag fill 9.7 - (3.4 + 1.85) = 4.45 ft bgs. Add 1.5 sks bentonite. Tag fill 6.5 - (3.4 - 1.85) = 1.25 ft bgs.				
09:47	10:10	Remove 2 ft section from casing string. No radiological contamination noted on casing string.				
10:10	10:25	Break				
10:25	11:30	Haul equipment to staging area (support equipment) in preparation of mobilization to the next bore hole.				
11:30	12:05	Lunch				
12:05	16:30	Install hydraulic cylinder on the 7 inch retainer. Also, initiate installation of the 7 inch casing pulling assembly. The assembly will need to be modified prior to completion. Secure site. Complete documentation.				
REPORT BY: D.E. Skoglie				REVIEWED BY: MG Gardner		
TITLE: Field Team Lead				TITLE: Project Manager		
SIGNATURE: 				DATE: 8-15-02		
				SIGNATURE: 		





## Page 1 of 1

SIGNATURE: Michael



## Page 1 of 1

J. (HPT)

SIGNATURE:

## Page 1 of 1

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## Page 1 of 1

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**APPENDIX B**  
**GEOLOGIC/SAMPLE LOGS**

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[illegible]

6/11/02	300 Area	Sample Lures 2-in diameter
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T furms Drilling - TX104/C3832

% distribution, mineralogy, sorting, color, mass, roundness, bedding features,

Sand depth 15.5' - 16' (6" liner)

sl. Backfill material 2.54  $\pm$  1/2 dark gray 18

brown, slightly reactive to HCL

rounded to sub-

round basaltiform w/f coarse

Sand matrix, very poorly sorted, slightly moist

Sample 15'-15.5'

56 Sample appears to be polymer material.

described above, stuff material

Sample 28-5729'

So backfill slightly moist 2.5% dune grass mix

brn. silt. gravel. Sand f-c grain very

poorly sorted, rounded-subrounded basalt grains

Study morning to HCL  
 $> 75\%$  bas. N

Sample 52.5-53  
 Sand; well sorted, salt and pepper distribution  
 90% M. Sand 10% coarse sand, slight minor  
 laminations; 60% basalt, 40% quartzite  
 feldspatics; dry; unconsolidated;  
 strong rxn to HCl; 2.54 w/2 light occasional  
 grayish brown \* by product of sampling?  
 Sample 52-53.5  
 Sand (consolidated on top) compacted  
 stuff? Bottom of unit same as above.  
 Sample 53.5-54  
 \* Sand; fining upward; top (1'-m sand)  
 bottom (m-coarse sand); mod - well sorted;  
 Unconsolidated, slightly damp. \* fine;  
 basalt pebble gravel; 2.54 dark grayish  
 brown; mod strong rxn to HCl  
 Sample 53.0-53.5  
 Sharp contact @ 53' 3" sandy lens  
 as on top of silty sand; sand clay;  
 silty sand slightly moist; silty sand  
 Unconsolidated; 2.54 w/2 both sand & silty sand  
 mod strong rxn for both; sand color best  
 exposed  
 exposed

Sample 28-28.5'  
 Moderate rxn to HCl, pebble gravel  
 broken up, stuff; some calcium carb  
 very poorly sorted; > 75% basalt  
 Mostly very fine - fine pebble gravel, occasional  
 medium pebble.  
 Sample 37-38'  
 Backfill material, slightly moist;  
 56; 60% very fine - fine pebbly, 40% fine sand  
 30% m-coarse sand; > 75% basalt  
 very poorly sorted unconsolidated;  
 2.54 dark grayish brown; slight -  
 mod HCl rxn.  
 Sample 44.5-45'  
 Silty sand, moist, consolidated  
 50% sand 50% silt. Sand cut sand -  
 fine sand) very little 1-4mm basalt  
 very coarse sand; strong rxn to HCl  
 2.54 4/2-3/2; well sorted  
 Sample 44-44.5'  
 Extruded water from sample. Same  
 as 44.5-45' sample. Bottom of tank  
 backfill on very fine quartzite pebble

Sample 60.5-62.0'	Sand, uniform throughout, 90% sand, dry; well sorted; 10% coarse sand; 100% quartz & feldspar; 40% basalt; 2.54 1/2 grayish brown; No rxn to HCL	Sample 69.5-70'	Contact @ 69.8" sand w/ laminated silt. Sand f-m sand; 60% g-flds. 40% basalt; well sorted sand; some oxidation in silt; 104 1/2 grayish brown. Strong rxn to HCL
Sample 61-61.5	Sand as described above. Strong rxn to HCL; same color.	Sample 69-69.5'	Sand (f-m sand); well sorted. Same lithology as above. 60% g-flds. 40% basalt; compacted (from sampling?). 104 1/2 light brownish gray; strong rxn to HCL
Sample 62.5-63	Sand as described above, dry, unconsolidated, 70% coarse, 30% medium, 2.54 5/2; slight rxn to HCL	Sample 70.5-71	Laminated silt in contact w/ coarse to some very coarse sand at bottom. Sand 50/50 g/f; silt cohesive; mod rxn to HCL for both sand and silt; 104 1/2
Sample 62-62.5	Sharp contact @ 62.4" w/ top coarse sand as described above. Bedded silt w/ cohesion 2.54 1/2 dark grayish brown, slightly moist; mod- strong rxn to HCL	Sample 70+70.5	Sand and sand grading to coarse sand; basalt pebble; yellow wood; Sand 20/40 g/f basalt. Strong rxn to HCL; 2.54 1/2 grayish brown

June 12, 2002

Sample 79.5-80

Sand, unconsolidated; minor laminations; fine upward ms → fine sand; 60% qtz fids 10% basalt; 2.54 5/16 grayish brown; mod to strong rxn of fine sand; little to no rxn to HCL for ms.

Sample 79-79.5

Laminated silt and f-m sand; thin lamination bottom half; thick silt bed in center of sample ~1" thick. Strong rxn to HCL; 2.54 5/16 grayish brown

Sample 83.5-84

Laminations up to silt and f-m sand; 60/40 8-fls; strong HCL rxn silt and sand; 2.54 1/2 dark grayish brown;

Sample 83-83.5

Sand; 70% med - 30% coarse; 60/40 qtz fids/basalt; 2.54 1/2 light brownish gray; strong HCL rxn

Sample 87.5-88

Sand; w/ minor silt laminations at top; med - coarse sand; occasional very fine pebbles; moderate rxn to HCL 2.54 5/16 brownish gray

Sample 87-87.5

Sand; fairly uniform; 70% med - 30% fine sand; fine sand near top; 2.54 5/16 grayish brown; strong rxn to HCL; dm

Sample 93.5-94

Sand; some bedding laminations 70% m - 30% c sand; occasional very coarse sand; unconsolidated; dry; 2.54 5/16 grayish brown; mod rxn to HCL

## Sample 93-93.5

Sand w/ very minor silt laminations;  
day; compact, 2.54/1/2 light brownish  
gray; mod. rxn to HCL; 60/40 g/f basalt,  
70% m - 30% f

## Sample 94.5-97.0

Sand; uniform 50% m - 50% f  
coarse sand; 50% basalt 50 g/fz feld;  
unconsolidated; slightly damp;  
2.54/1/2

## Sample 104-105

25 Silty fr-v. fn sand; w/1  
sorted, mottled w/ fn sandy silt  
yellowish 80% fr-v. fn sand  
20% silt 2.54/1/2 H yellowish  
brown; mod-strong rxn to HCL  
compact; 1 cm thick silt  
lens and laminated towards top  
day;

## Sample 110.5-111

6.2 m/s Slightly abby, clayey silt  
sand, v. poorly sorted, compact and  
cemented w/  $CaCO_3$   $\pm 50\%$  v. fn  
pebble = max. particle;  $CaCO_3$  includes  
abundant, pebble rounded and non-bedded  
2.54/1/2 strong rxn to HCL

Contact w/ old creek talus @ 110.4'

Contact is sharp

## Sample 110-110.5

Silt, uniform, compact, minor  
laminations,  $CaCO_3$  nodules at bottom  
of lens; 2.54/1/2 dark grayish  
brown; strong rxn to HCL

## 114-115

$CaCO_3$  very very very compact!  
Extruder was unable to push out  
poorly sorted, some basalt pebbles interspersed  
w/ in lens.  $CaCO_3$  cemented in lens, try  
hammering it out for sample, mottled to stone  
gray & light brownish gray.  $CaCO_3$  has  
fin material in it. Sandy silt to silty sand

50% silt sea fin sand. Strong  
run to HCC; clay; almost powdery.

Sample 121-122'

Some material as above, bottom

of 122' liner trap light and  
dark swirl 100% (silt/CaCO<sub>3</sub> bedding  
defined) 104% 61% light brownish

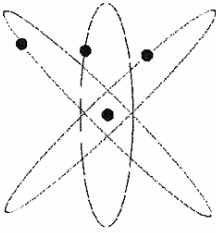
gray; strong fine A.M. Contact

of swirl bedded stuff approx. 4" into  
liner bottom. Silt/sandy maybe clayey



**APPENDIX C**  
**GEOPHYSICAL LOGS**

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## Pacific Northwest Geophysics

4200 West 19<sup>th</sup> Ave  
Kennewick, WA 99338  
(509) 735-3963

***"No Job Is Too Large or Too Small"***

February 26, 2002

Mr. James Meisner  
Duratek Federal Services, Inc.  
345 Hills Street  
Richland, WA 99352

Dear Mr. Meisner,

Re: SUBCONTRACT NO. A00536, Task Order 16  
TX Tank Farm Moisture Review and Borehole Survey Data Processing

Enclosed are the deliverables for the Task Order 16 to subcontract A000536. The scope of the task involved analytical support for processing moisture survey results for 14 boreholes in the TX Tank Farm. The deliverables include for each borehole survey:

- MathCad calculation verification that documents: calibration date, calibration coefficients, borehole identification number, raw survey data, casing and density corrections (not applied), and computed moisture content. The program output (ASCII tabular file) included survey depth, computed moisture, raw moisture probe count rate, and count rate uncertainty (1 sigma, percent).
- Log survey header sheet that identifies: logging probe type, logging company, project name, borehole identification numbers, borehole information, logging information, and analysis information.
- Log survey results plot (one page with two tracks, 75 feet per track with 10 feet overlap).
- Log analysis and summary report sheet that identifies: logging probe type, logging company, project name, borehole identification number, environmental corrections, system performance verification, repeat interval, depth reference, and general notes.
- A copy of the borehole survey data sheet that records the field logging activities.
- Hard copy survey results and electronic copy (WinZip format) of: raw survey spectra files, analysis result files, log survey report files, and special request files (i.e. cross section plot of the survey results and tab delimited results files).
- Additional observations and research notes identified during the analysis are summarized as an attachment to this letter.

If you have any questions, or if I can be of further assistance, don't hesitate to call me at (509) 735-3963.

Sincerely,

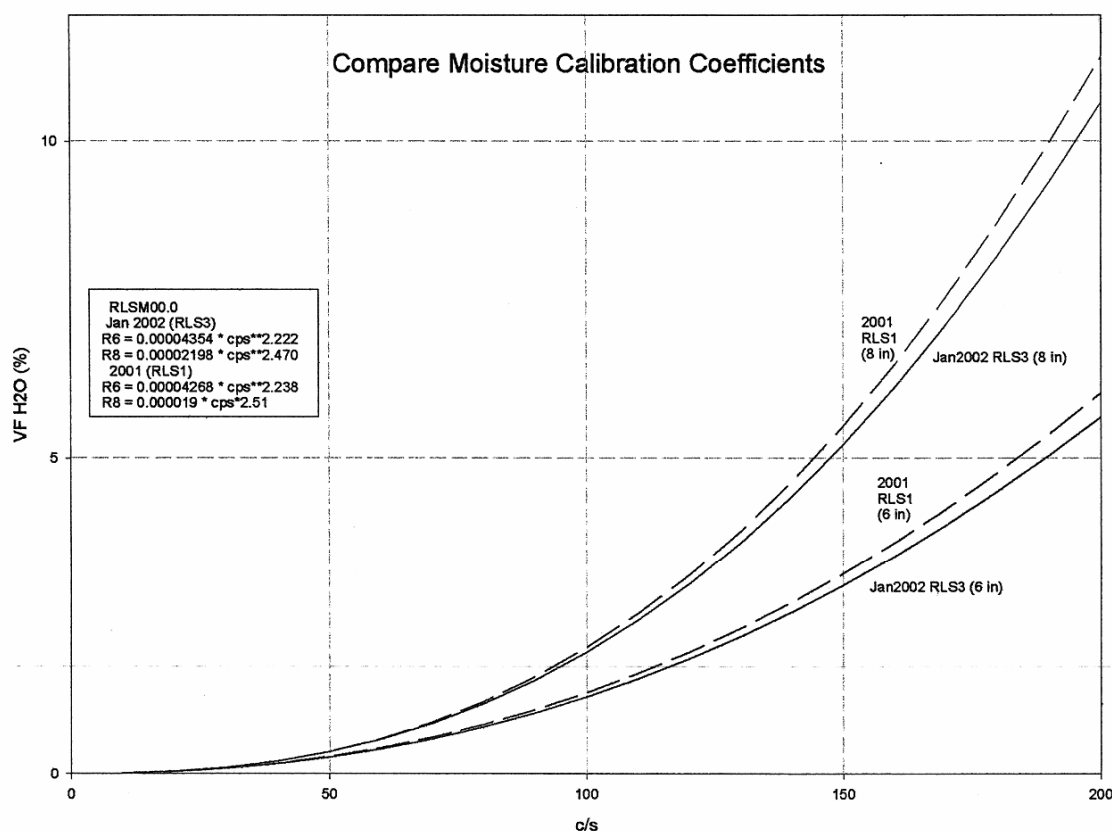
Randall Price

February 26, 2002

## TX Tank Farm Moisture Surveys

### Analysis Observations and notes

- No formation density correction was applied. The same density as the calibration models is assumed to represent environmental conditions in the boreholes.
- No casing thickness correction was applied. The same casing type and thickness as the calibration models (schedule-40) was associated with the borehole.
- Probe calibration (RLSM00.0) was 7% lower for Jan 29, 2002 calibration (RLS-3) when compared with previous probe calibration (2001) on RLS-1. The graph below compares the two sets of calibration coefficients. Similar changes in the calibration data have been observed on earlier occasions. Discussions among the other borehole geophysics experts and the project manager have concluded that the calibration and associated borehole survey results are valid and may reliably be used for geologic correlation and indication of relative moisture changes.



- The calibration model with the highest moisture content is 20 vf%. The expected maximum moisture content (personal communication with Russ Randall) for which the probe response is valid is between 35 and 50 %vf. [i.e. probe response trend will follow the calibration curve]. At moisture contents above 40 % [up to 100% water tank] the response is very steep and will not follow the power law function of the calibration curve.
- Four borehole surveys contain high neutron responses (greater than 20% apparent moisture content) 51-03-01, 51-03-11, 51-04-02, and 51-04-06. In each borehole the high moisture

content occurred within 30 feet of ground surface, in either one extended zone approaching 20 feet thick or in two thinner zones.

- The historic tank farm neutron logs for these four holes (very high moisture content) were reviewed briefly. In three of the holes the historic neutron logs also had high neutron readings in the same general area. The historic neutron logs were gathered in 1990 and 1991 for three of these four boreholes. The fourth borehole (51-03-11) did not have a historic neutron log. Additionally, the zones with the highest neutron response do not contain high gamma contamination that may be contributing to the neutron response.
- Two of the boreholes (51-03-01 and 51-03-11) with high neutron moisture content also contain an unstable contamination zone (deeper in the borehole). Both unstable contamination zones show increasing activity from 1987 through the end of the historic surveillance logging data. A copy of the relevant pages from the TX Tank Farm Dry Well Analysis Report is included.
- A problem spectra file was identified during data processing of borehole 51-00-03. Spectra MB711603.chn at 149.5 ft (gross = 265 c/s with 15.46 sec LT) had very high count-rate. The spectrum shows a low energy anomaly (channel 37-68) that is not characteristic of probe response. Problem occurred only in one spectrum. If the anomalous channels are removed from tool response then count rate drops to 154 c/s (typical of adjacent zones; and was therefore substituted for processing moisture content. Several spectra files were examined from the surveys of all 14 boreholes. No other problem spectra files were identified.

**Borehole 51-03-01**

Contamination (Cs-137) from 0-4 feet is Tank Farm Activity.

Contamination (Cs-137) from 4-14 feet is Stable.

Contamination (Co-60) from 45-62 feet is Unstable Early.

Contamination (Co-60) from 62-70 feet is Unstable.

Grade thickness product over 0 to 4 feet is erratic and indicative of tank farm activity.

Grade thickness product over 4 to 14 feet closely matches a Cs-137 (HPGe identified). Large statistical deviations confuse the possibility of a clear match. Thus the classification is stable, given the presence of the HPGe data.

Grade thickness product over 45 to 62 feet is increasing starting in 1977. From 1980 to 1983 the grade thickness product decreases faster than Co-60 decay (HPGe identified). The grade thickness product matches Co-60 decay from 1983 until 1994, thus the classification is unstable early. The HPGe logging data identified Eu-154 in this interval, but at levels too low to influence the match with the grade thickness product, and thus was not shown. (Not only is the intensity of Eu-154 nearly 1/5<sup>th</sup> the peak of Co-60, but the depth interval is much wider for the Co-60.) There is some indication of downward movement. At the start of the data in 1977, the depth profile is a single zone near 50 feet. With time this zone develops a lower zone that could be either a second front experiencing lateral influx or the 50-foot interval beginning a downward movement. Since the grade thickness product is calculated over the entire depth interval of possible downward movement, the large influx starting in 1977 is a lateral influx in addition to the downward movement.

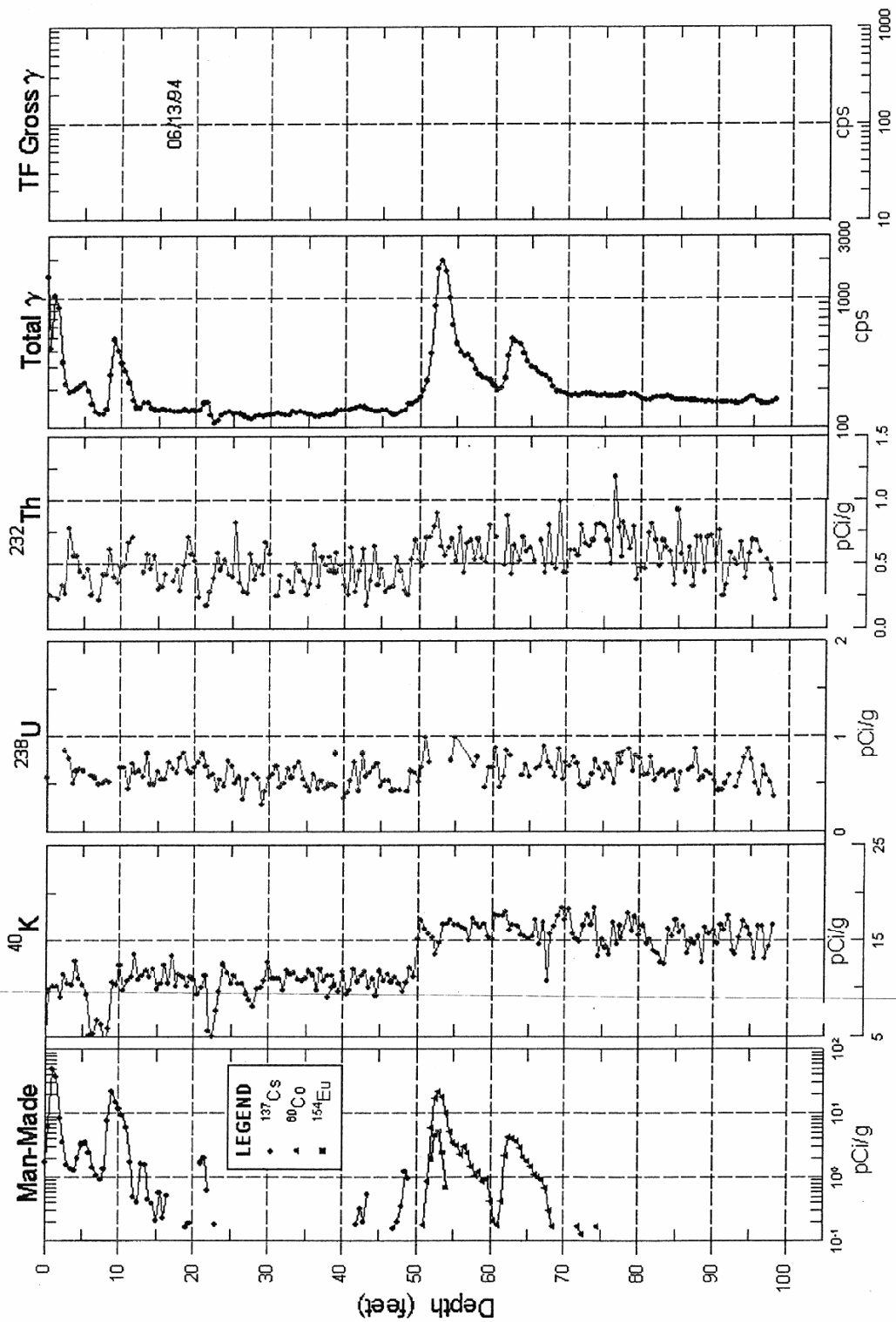
Grade thickness product over 58 to 68 feet is increasing starting in 1980, until 1992. At no time is there a match with the Co-60 (HPGe identified) decay. Thus the classification is unstable, and the Co-60 decay curve is plotted for reference.

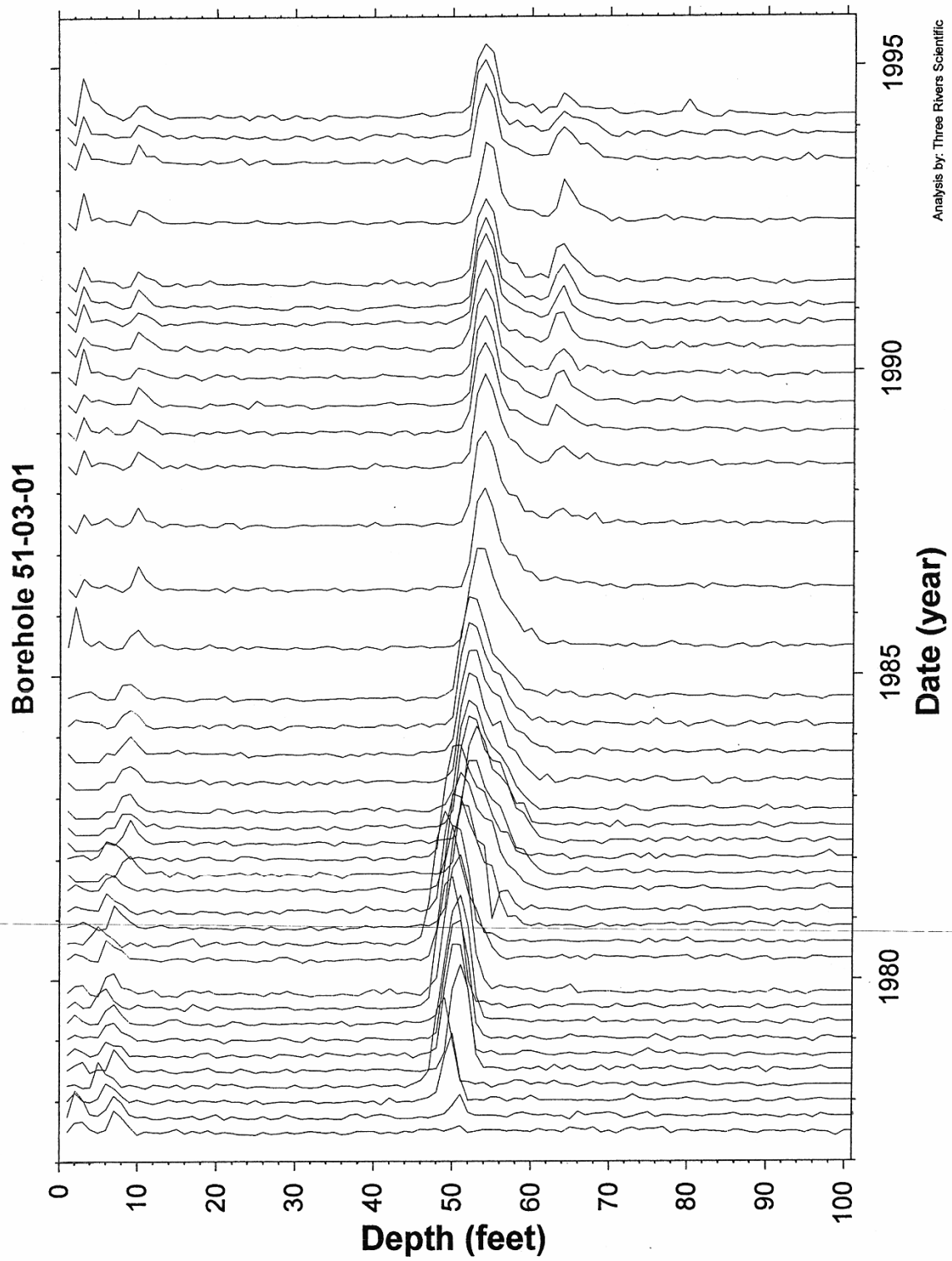
**Gross Gamma Survey Information**

Probe Type Processed :	04: NaI
Other Probe Types :	03: Neutron
Survey Depth :	100 ft
First Survey Date :	7/1/1977
Last Survey Date :	6/13/1994
Number Surveys Processed :	458

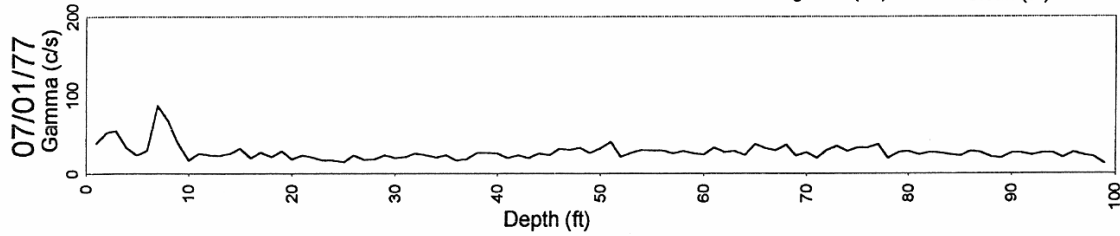
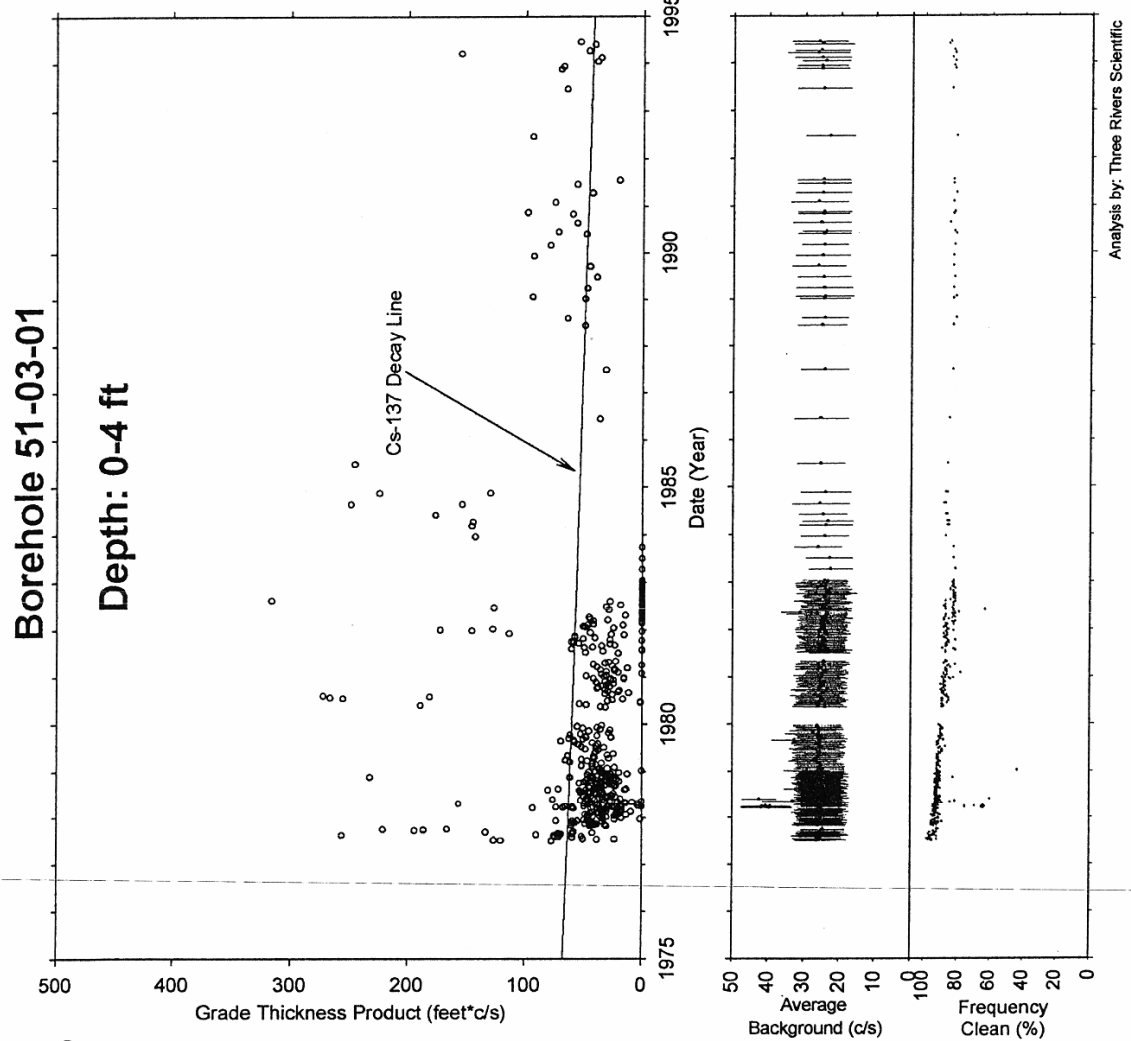
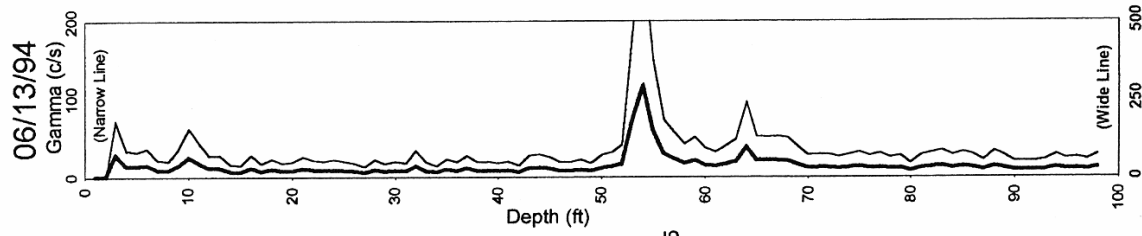
**Analysis Notes**

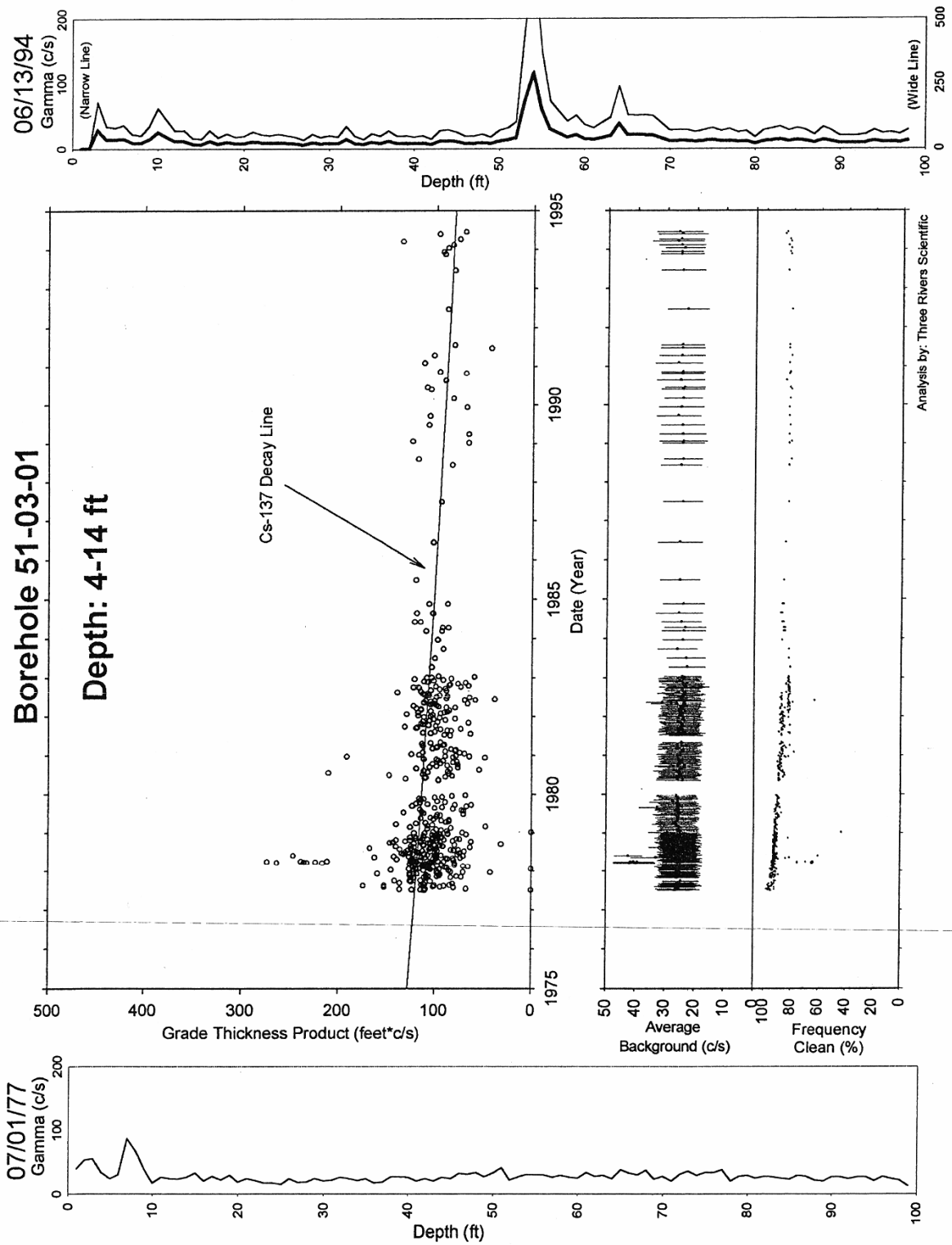
Method Used to Compute Background :	Threshold 0<val<50
Depth(s) where Contamination Identified in Gross Gamma Surveys :	0-4 ft Tank Farm Activity 4-14 ft Stable 45-62 ft Unstable Early 62-70 ft Unstable
Analyst Name :	R.R. Randall
Company Name :	Three Rivers Scientific

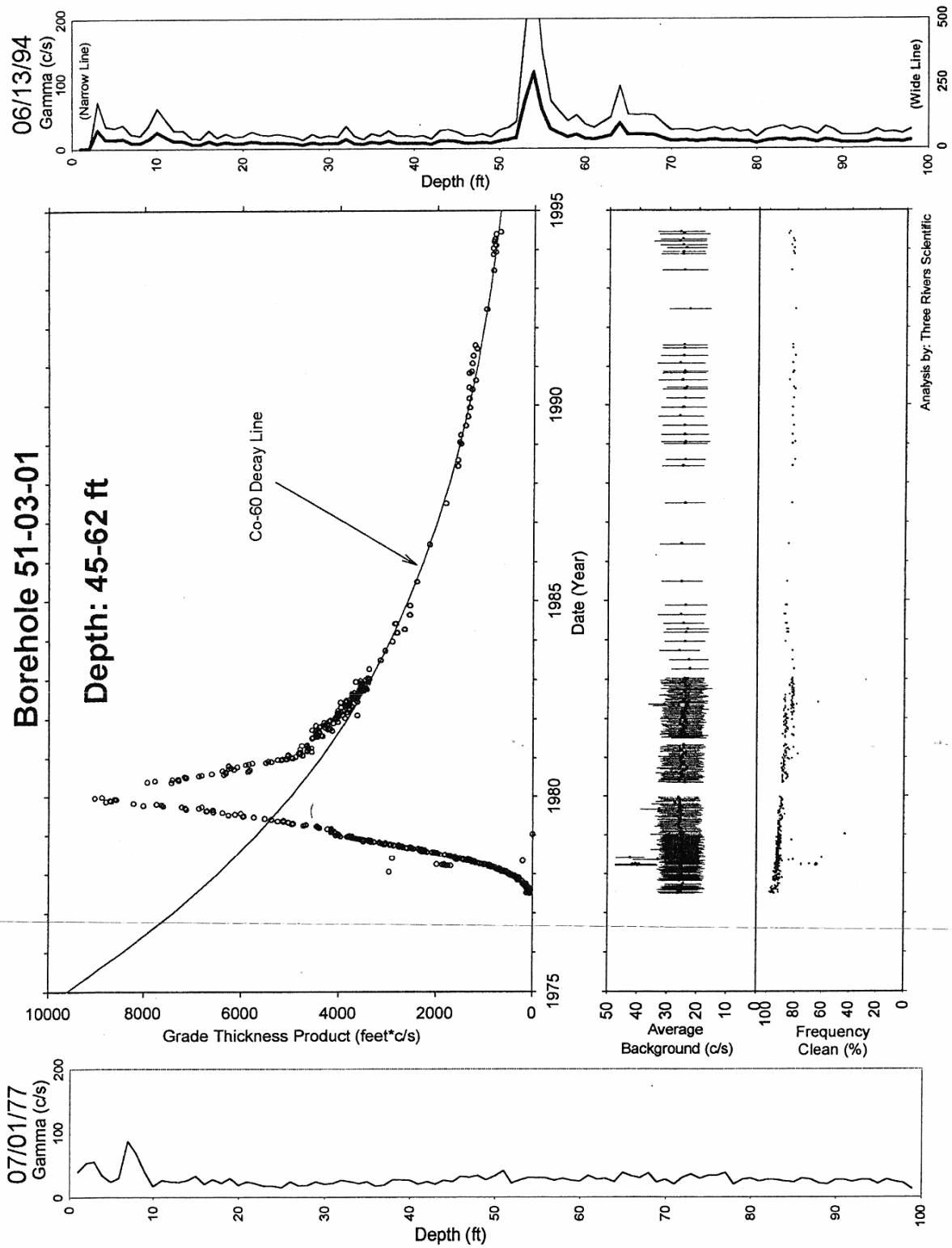
**51-03-01 Combination Plot**

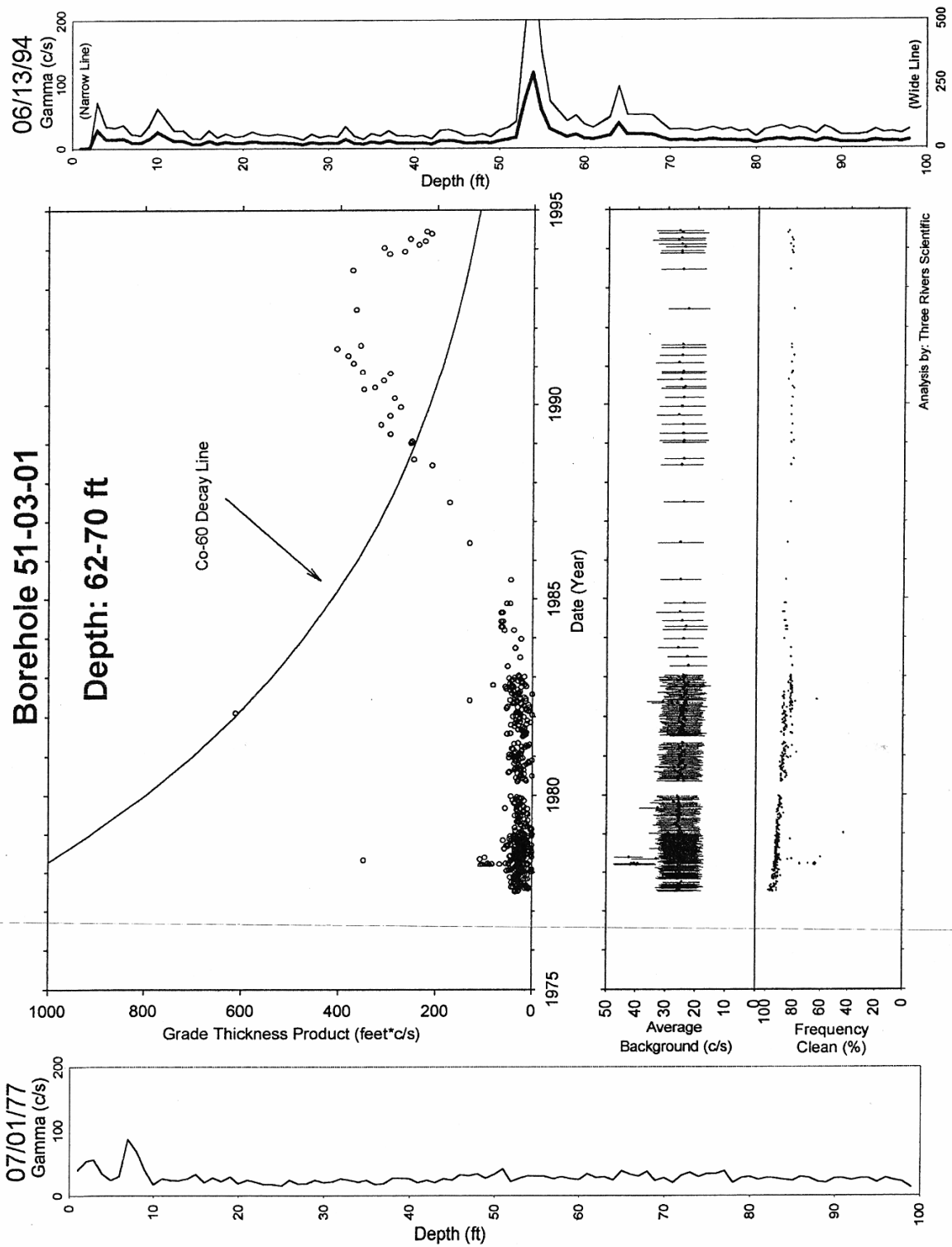












**Borehole 51-03-11****Contamination (Cs-137) from 45-72 feet is Unstable.**

The stack plot shows a zone with only a somewhat broad peak from 45 to 58 feet in 1980, at the start of the historical data. A lower lobe centered near 61 feet begins to grow soon after 1980 and by mid 1986 is higher than the 50 foot peak. This 61 foot peak then diminishes and moves deeper. It is possible that the 50 foot zone is separate and stable, and the instability is from the deeper activity. Better depth resolution would be required to make a more definitive conclusion.

Grade thickness product over 45 to 72 feet increases starting in 1980. There is no time period for a match with an exponential decay. The grade thickness spans the entire depth for the history of these data, but the stack plots shows downward movement, thus the classification of unstable. The fact that the grade thickness product is not consistent with the calculated decay implies that the total downward movement is not conserved and the downward movement is accompanied with lateral influx.

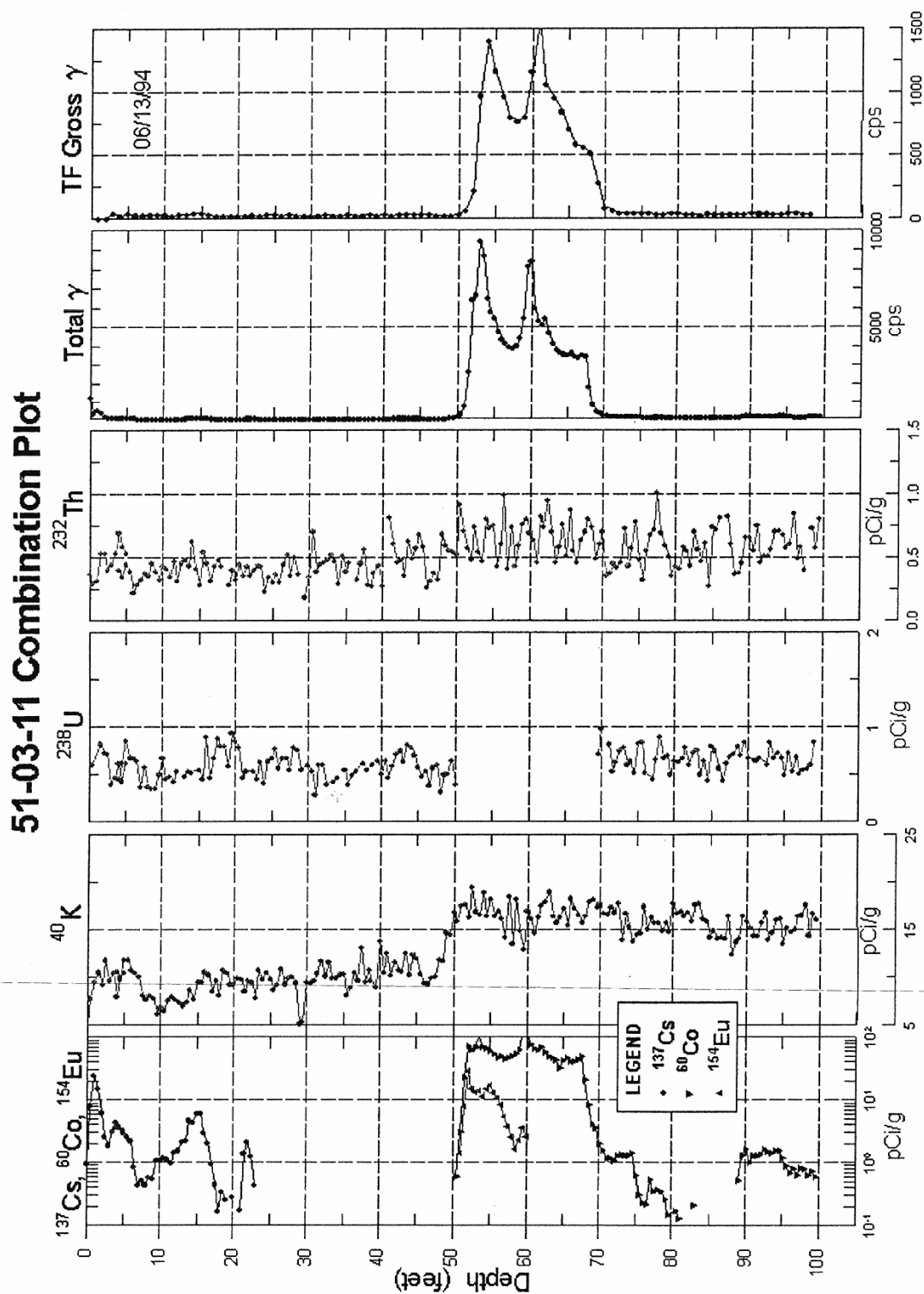
No HPGe data are available for this borehole.

**Gross Gamma Survey Information**

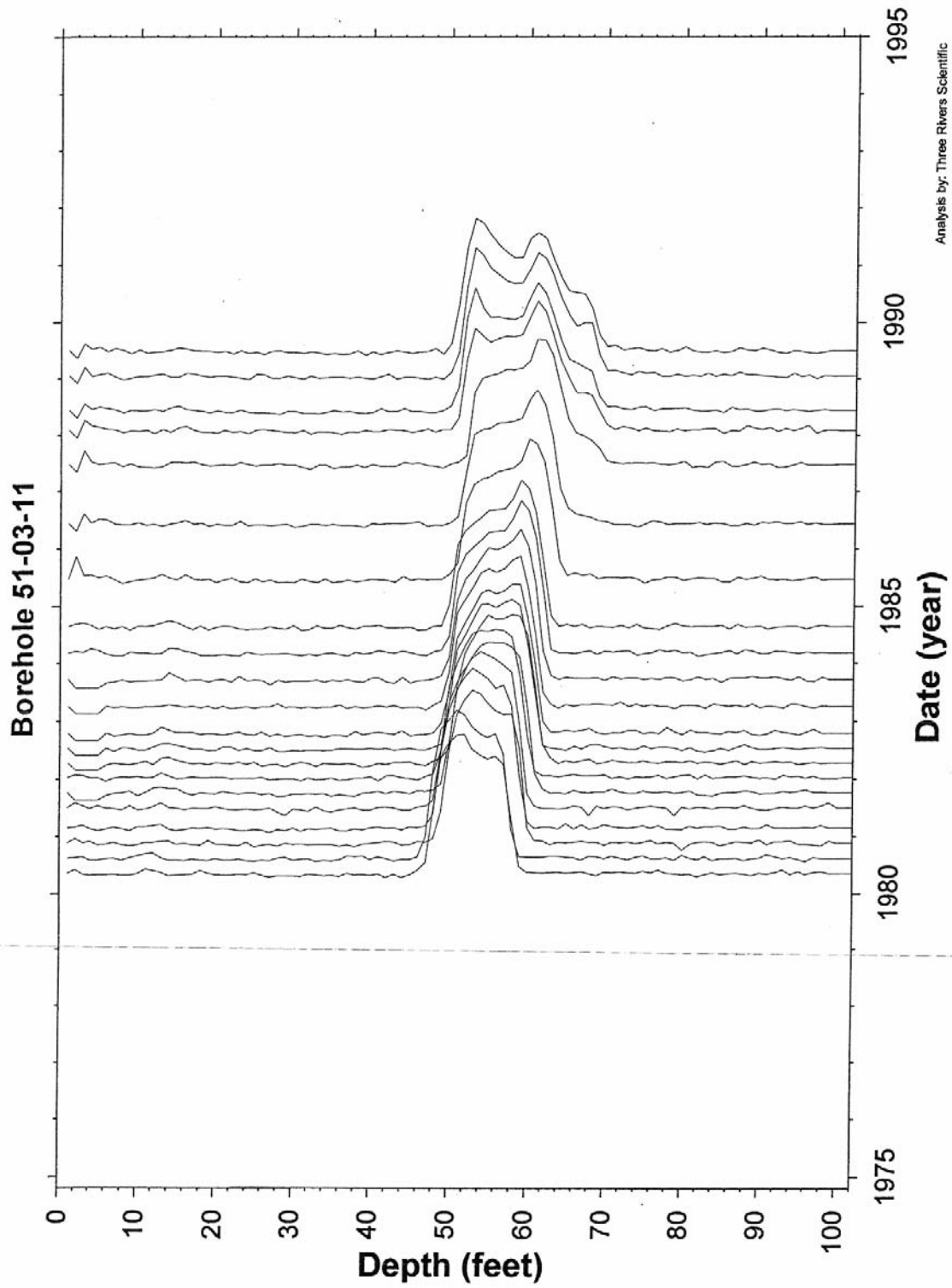
Probe Type Processed :	04: NaI
Other Probe Types :	03: Neutron
Survey Depth :	100 ft
First Survey Date :	5/7/1980
Last Survey Date :	6/28/1989
Number Surveys Processed :	166

**Analysis Notes**

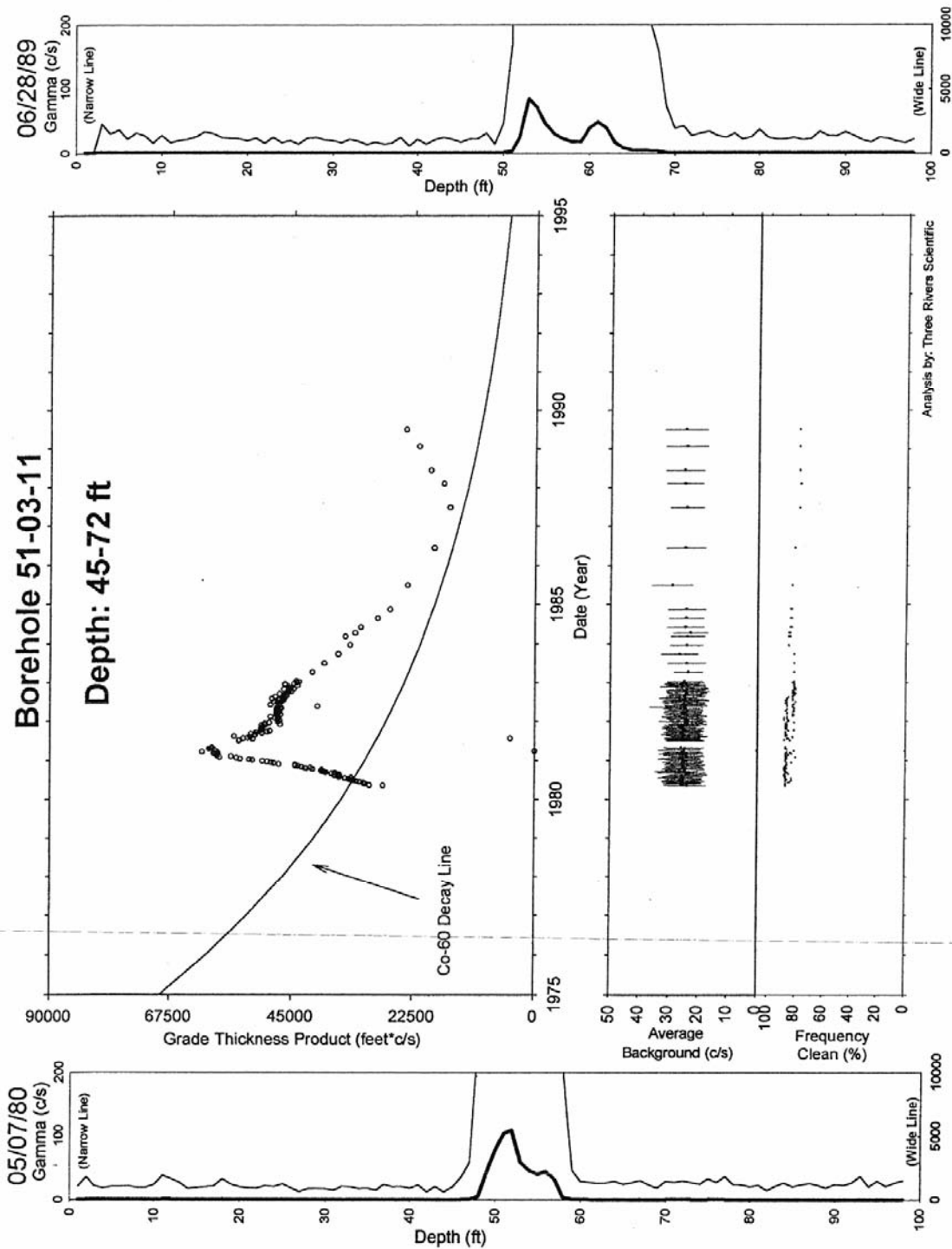
Method Used to Compute Background :	Threshold 0<val<50
Depth(s) where Contamination Identified in Gross Gamma Surveys :	45-72 ft Unstable
Analyst Name :	R.R. Randall
Company Name :	Three Rivers Scientific

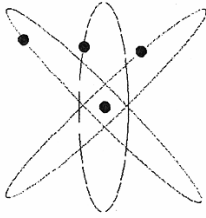


RPP-6353, Rev.0.









## Pacific Northwest Geophysics

4200 West 19<sup>th</sup> Ave  
Kennewick, WA 99338  
(509) 735-3963

***"No Job Is Too Large or Too Small"***

March 5, 2002

Mr. Kent Reynolds  
Duratek Federal Services, Inc.  
345 Hills Street  
Richland, WA 99352

Dear Mr. Reynolds,

Re: SUBCONTRACT NO. A00536, Task Order 16, Modification 1  
TX Tank Farm Moisture Surveys with High Moisture Content

High moisture content was identified within the top 30 feet in four of the 14 dry-wells recently surveyed in the TX Tank Farm. The maximum computed moisture content in these four dry-wells approaches saturated conditions and may be of immediate concern unless the source of the high hydrogen (moisture) content can be reasonably identified.

Some of the proposed sources for the high moisture content include (1) a leaking water line(s) that run through the tank farm, or (2) grout injected when the larger diameter starter casing was removed.

Your request was to examine the logs with high moisture responses for the possibility that they are the result of cement (i.e. grout) injected between the 6-inch casing and formation when the larger starter casing (8-inch) was removed after drilling.

My conclusion is that the high moisture content recorded in the four dry-wells (51-03-01, 51-03-11, 51-04-02, and 51-04-06) is most likely the result of grout injected when the starter casing was removed. The results of the review are discussed in the attachment.

If you have any questions, or if I can be of further assistance, don't hesitate to call me at (509) 735-3963.

Sincerely,

Randall Price

March 5, 2002

## TX Tank Farm Holes with High Moisture Content

### Review Notes

#### Background

The four tank farm dry-wells with high apparent moisture content (greater than 20%) are 51-03-01, 51-03-11, 51-04-02, and 51-04-06. In each borehole the high moisture content occurred within 30 feet of ground surface and was delineated in either one extended depth zone (approaching 20 feet thick) or in two thinner zones. The possibility was examined that these zones are the result of grout injected to fill the void space between the 6-inch casing and the formation wall when the 8-inch starter casing was removed.

#### Historic Tank Farm Neutron Logs

When the high moisture zones were identified, during processing of the moisture log data, the historic tank farm neutron logs for these four holes were briefly reviewed. The historic neutron logs (1991) also contained high neutron readings in the same general depth intervals, in the three dry-wells where the historic neutron logs are available. The historic neutron logs showed that the high moisture content was not a recent occurrence.

#### Moisture Probe Response in Calibration Model with Grout Jacket

The moisture gauge was characterized in the calibration models with a grout jacket constructed around a 4-inch casing and inserted into the large diameter (8-inch) models. The moisture probe count rate in the grout jacket was very high and had a lack of difference, indicating that the grout jacket dominates the instrument response. The table below shows the probe count rates and computed moisture content for the 6-inch calibration models and grout jacket. These data show that a grout annulus could product anomalous moisture content.

Radionuclide Logging System In Situ Vadose Zone Moisture Calibration WHC-SD-EN-TI-306 (May 1996) R. Randall, J. Meisner, R. Price  Probe: RLSM1.1 Calibration Date: Aug. 1995 Calibration Coefficients (6-inch): $V = 0.001597 * (cps)^{2.013}$		
Calibration Model	RLSM1.1 (c/s)	Computed Moisture (%-vf)
6" (5.0 %-vf)	54.2	4.94
6" (11.7 %-vf)	84.9	12.2
6" (29.8 %-vf)	106.8	19.4
Grout Jacket (5 %-vf)	161.7	44.6
Grout Jacket (20 %-vf)	163.0	45.3

#### Drilling Records

A summary of the drilling activities important to geophysical logging (i.e. drilling and final casing information, including: number of strings, size, maximum depths, grout injection, and perforations) is available with the base line logging project using the high resolution germanium spectral gamma ray probe. The log survey information was examined for the 14 TX tank farm boreholes on which the moisture log was acquired. In only four boreholes the drilling record summary identified that grout was injected when the 8-inch starter casing was removed. The table below shows that the four boreholes

where starter casings were used, then removed, and grout was added to fill the voids are the same four boreholes that had high moisture content.

Hole ID	Drill Date	Starter Casing	Starter Casing Removed	Grout
51-03-01	Jun 1977	8-inch, 18-ft long	Yes	Yes, unknown amount
51-03-11	May 1977	8-inch (unknown length)	Yes	Yes, unknown amount
51-04-02	Apr 1976	8-inch, 20-ft long	Yes	Yes, 71 Gal.
51-04-06	Apr 1976	8-inch, 20-ft long	Yes	Yes, 160 Gal.

The volume of grout injected to fill the void space (between 6-inch casing and formation wall) after back-pulling the 8-inch starter casing was computed for comparison with the reported amounts.

- Void space is the volume difference between the 20-ft length of 8-inch casing minus the 6-inch inner casing
- Volume =  $(\pi * (\text{Radius square}) * \text{height})$
- Volume 8-inch casing (20 ft long) = 6.98 cu-ft
- Volume 6-inch casing (20 ft long) = 3.93 cu-ft
- Void space (8 minus 6 inch volumes) = 3.05 cu-ft
- Void space (gallons) = 22.8 gal = 3.05 cu-ft \* 7.481 gal/cu-ft

The volume of grout required to fill the void space left by the 8-inch starter casing (22.8 gal) is significantly less than the volume of grout reported (i.e. 71 and 160 gal). There is the possibility that some of the grout may have migrated through the high porosity unconsolidated sediments to depths below the starter casing depth, such as (23' in 51-03-01), (29' in 51-03-11), and (25' in 51-04-02).

### Off-Normal Drilling Event

The drilling record summary for 51-04-06 had an off-normal occurrence: "The concrete tank footing was encountered at a depth of 47 ft. The drill string was withdrawn to a depth of 20 ft, and 10 ft of the 8-in starter casing was pulled back. The drill string was angled sufficiently to allow the bottom of the string to clear the footing. The interval between depth of 20 and 47 ft was re-drilled. This operation resulted in considerable reaming, spalling, and caving of the upper portion of the borehole; accordingly, a substantial thickness of grout may exist between the surface and depth of about 47 ft."

It is surprising that the moisture survey of 51-04-06 did not show any indications of grout (high moisture content) below the bottom of the 20-ft of starter casing.

### Non-Related Finding

While reviewing the drilling record summary another inconsistency was identified. Borehole 51-00-07 was reportedly completed on March 7, 1949 in a dual casing configuration with 12-inch casing to 50 ft and 10-inch casing to 150 ft. There is no record of 8-inch casing that is present in this borehole. The HPGe survey processed the data based on a single 8-inch casing and demonstrated by the lack of change in natural radionuclide activity that a second casing is not present in the borehole. The conclusion is that the drilling records are describing a borehole different than 51-00-07.

### Conclusion

Based on the review, documented above, there is no reason to reject the present assertion that the high moisture readings are the result of grout. The high moisture content recorded in the four dry-wells (51-03-01, 51-03-11, 51-04-02, and 51-04-06) is most likely the result of grout injected when the starter casing was removed.

**Borehole Survey Log Header**

Duratek Federal Services, Inc.

Project: 241-TX-104 Drilling

Borehole: C3832

Log Types: HPGe Spectral-Gamma &amp; Neutron-Moisture

**Borehole Information**

Well ID	<u>C3832</u>	Water Depth	<u>None</u> ft	Total Depth	<u>115</u> ft
Elevation Reference	<u></u>	Elevation	<u>n/a</u> ft		
Depth Reference	<u>Ground Level</u>	Casing Stickup	<u>4.23</u> ft		
Casing Diameter	<u>5.87</u> in I.D.	Depth Interval	<u>0 to 112.5</u> ft	Thickness	<u>0.59</u> in
Casing Diameter	<u></u> in I.D.	Depth Interval	<u></u> ft	Thickness	<u></u> in

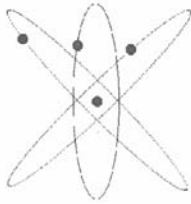
**Logging Information**

Log Type	Neutron-Moisture Gauge	HPGe Spectral-Gamma
Logging Unit	RLS-1	RLS-1
Logging Engineer	J. Meisner	J. Meisner / S. Kos
Instrument ID	RLSM00.0	RLSG07000S01.0
Instrument Calibration Date	Jan. 29, 2002	Oct. 29, 2001
Survey Date	Jun. 4, 2002	Jun. 6, 2002
Depth Interval / Prefix	0 to 80 ft MC01	0 to 27.5 ft A728
	76 to 115 ft MC02	25 to 97.5 ft A729
	100 to 114 ft Repeat	94 to 115 ft A730
		75 to 86 ft Repeat

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	June 13, 2002

Notes: The repeatability (precision) of the Moisture and Gamma surveys is good. U-238 was detected from 104 to 108 feet at concentrations near the gamma survey minimum detection levels (10 pCi/g). Co-60 was detected from 76 feet to the maximum survey depth of 115 feet; maximum concentration is 1.2 pCi/g at 79.5 feet. Moisture for 7.0-inch O.D. borehole was computed using the 6.56-inch O.D. calibration model coefficients.



## Pacific Northwest Geophysics

4200 West 19<sup>th</sup> Ave  
Kennewick, WA 99338  
(509) 735-3963

**"No Job Is Too Large or Too Small"**

June 14, 2002

Mr. Kent Reynolds  
Duratek Federal Services, Inc.  
345 Hills Street  
Richland, WA 99352

Dear Mr. Reynolds,

Re: SUBCONTRACT NO. A00536, Task Order 18  
TX-104 Tank Farm Borehole (C3832) Survey Data Processing

Enclosed are the deliverables for the Task Order 18 to subcontract A000536. The deliverables are HPGe spectral gamma and Neutron Moisture survey results for C3832-TX-104 and include:

- Moisture calculation from MathCad.
  - MathCad results identify: borehole ID, calibration date, coefficients, and casing correction. No density correction was applied.
  - Casing correction factor (multiplier) is 1.339.
  - Calibrations coefficients are  $\%vf=0.00004354CR^{2.222}$  (6-inch calibration model)
  - MathCad output file "Moist.dat" is ASCII. Tabular columns are: depth, moisture, raw count rate, and count rate uncertainty (1 sigma, percent).
- Radionuclide concentration from LgCalc.
  - All gamma photo peaks above MDL were identified to assure all radionuclides are included in the analysis results. Photo peak uncertainties less than 30% are above MDL levels. Radionuclide identification phase is in sub-directories "-RadID".
  - Casing correction information is shown on the Borehole Survey Log Header.
  - Calibration coefficients are:  $\epsilon(E)=1/(11.19E^{0.1068})$  as per ref. RLSG07000S01.0 calib. date Oct. 29, 2001; report date Jun. 3, 2002)
  - Minimum Detection Levels are listed in the Log Analysis Summary Report.
- Final survey results in Microsoft Word ".doc" format. The results file contains:
  - Borehole Survey Log Header (Moisture & Gamma surveys merged as one form)
  - Log survey results plot. One page containing both Moisture and Gamma results.
  - Log Analysis Summary Report (Moisture & Gamma merged)

Thank You,

Randall Price

## Log Analysis Summary Report

Duratek Federal Services, Inc.

Project: 241-TX-104 Drilling  
Log Type: Neutron-Moisture & HPGe Spectral Gamma

Well ID: C3832  
Log Dates: June 4-6, 2002

### General Notes:

The moisture survey shows that the formation moisture content gradually increases from about 5 vf% (volume fraction percent) to near 15 vf% and that several thin zones of higher moisture content are present through out the hole. The large increase in moisture content from 43 to 45 feet is interpreted as moisture accumulation above the compacted zone at the base of the tank excavation. The change in measurement geometry at the surface (0 ft) dominates the detector response and the low apparent moisture content may not be correct. The moisture survey is appropriate for identifying changes in the relative moisture content.

The gross gamma increase in the zone from 76 to 86 feet is from Co-60. The increase from 100 to 110 feet is due to increase concentrations of the natural radionuclides (uranium and thorium) and the two detected man-made radionuclides (U-238 and Co-60). The increase in detector responses (especially Total Gamma) at the survey bottom (114 feet) is the result of the detector entering the open hole below the drilling casing.

**Environmental Corrections:** The casing thickness correction (as shown on the Borehole Survey Log Header) was applied to the detector responses before computing the apparent moisture content and radionuclide concentration. No formation density correction was applied since it is assumed to be similar to calibration model densities (approx. 1.76 g/cc). No casing correction was applied to the Total Gamma due to Compton down-scatter interference.

**Depth Reference:** Zero depth of log survey is at ground level.

**System Performance Verification:** The gamma survey pre- and post-log verification was performed using "Coleman #1" mantles. The maximum FWHM (full width at half maximum) for the 583 keV gamma ray photo peak ( $^{232}\text{Th}$ ) was 2.1 keV. The maximum acceptable FWHM resolution is 3.1 keV for probe RLSG07000S01.0.

The moisture survey pre- and post-log verification measurements (695 and 696 c/s respectively) were within the range of previous system performance checks.

**Repeat Interval:** The repeat intervals have excellent agreement with the main log. (Moisture repeat is 100-114 ft.) (Gamma repeat is 75-85 ft.)

### Radionuclides:

- Cs-137 is present at the surface (0 to 1 feet) at a concentration less than 1 pCi/g.
- Co-60 was detected from 75 feet to the maximum survey depth (115 feet). The maximum concentration is 1.2 pCi/g at 79.5 feet.
- U-238 was detected from the 1001 keV gamma peak at concentrations near MDL from 100 to 109 feet. The presence of U-235 (186 keV gamma peak) could not be identified through the thick drilling casing.

	Co-60	U-238	Cs-137
<b>max. Concentration</b>	1.2 pCi/g @ 79.5 ft	15 pCi/g @ 106 ft	0.5 pCi/g @ 0.5 ft
<b>max. Depth at MDL</b>	> 115 ft	109 ft	1 ft
<b>MDL</b>	0.1 pCi/g	10 pCi/g	0.1 pCi/g



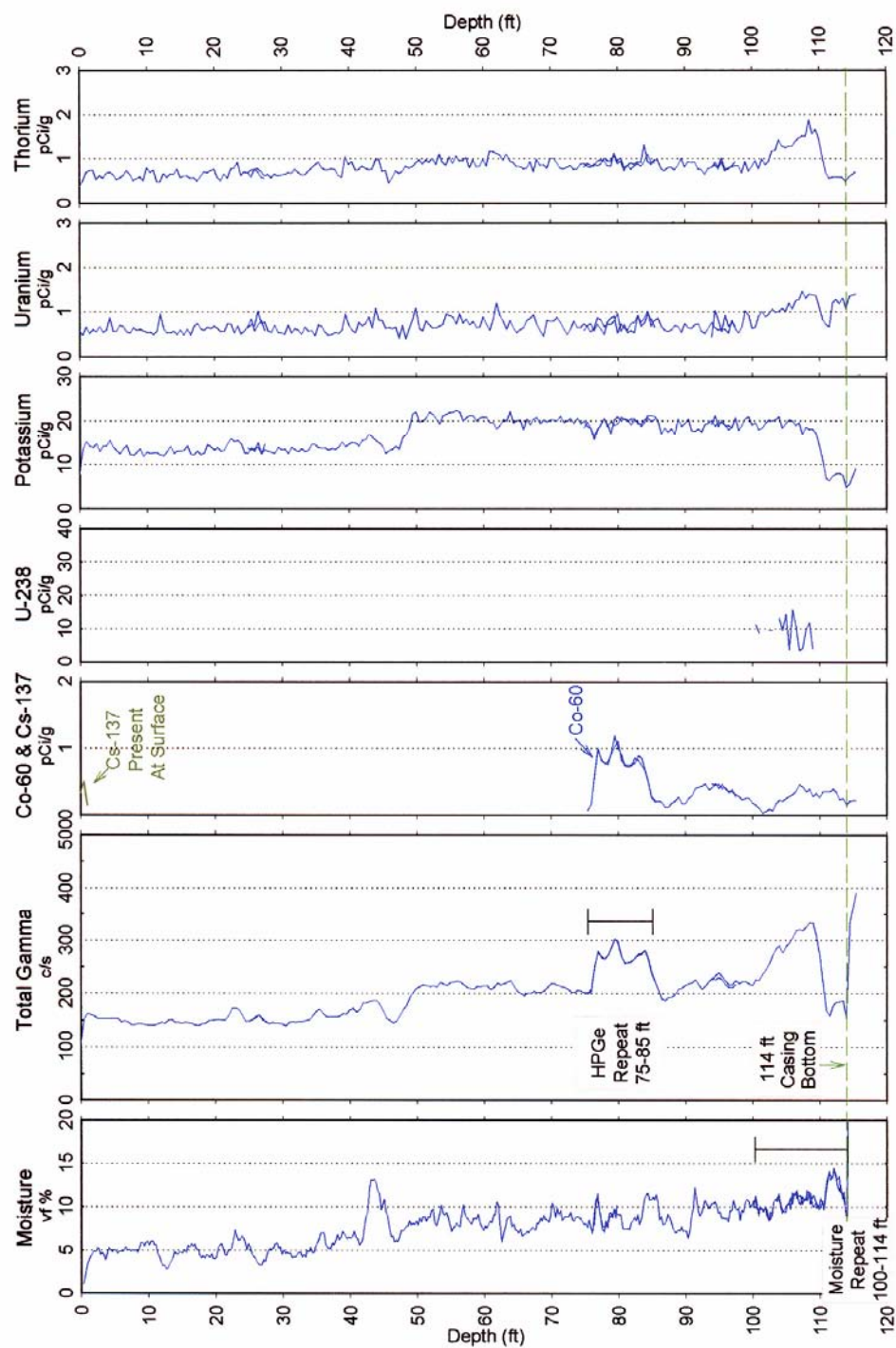
# Spectral Gamma Ray and Moisture Log Survey

Duratek Federal Services, Inc.

Log Date: June 2002

Project: Tank Farm Drilling - TX-104

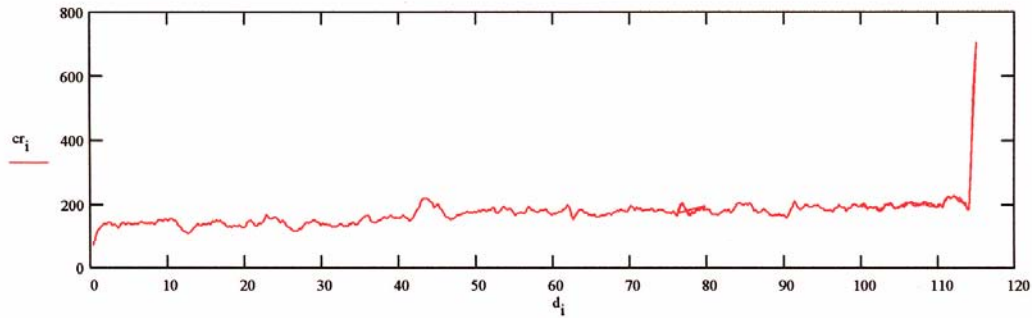
Borehole: C3832



Prepared by: Pacific Northwest Geophysics

## Moisture Calculation (Casing Corrected &amp; NO Density Correction)

A := READPRN("0gross2.dat")    d := A<0>    cr := A<1>    n1 := last(d)    i := 0..n1    Hole ID: **C3832 TX-104**

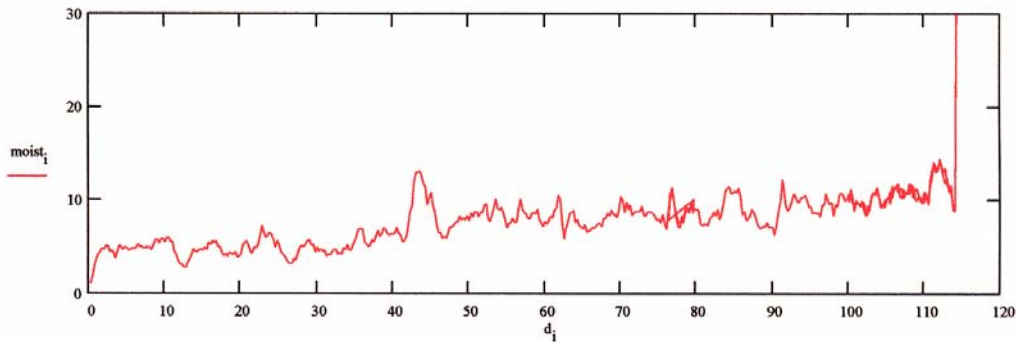


Casing Attenuation (beyond calibration model) :     $t := .590 + \frac{0}{2}$     Thickness (inches)    t = 0.59  
 $attn := 1.311 - .9560 \cdot t$      $attn = 0.747$      $f := \frac{1}{attn}$     f = 1.339    Casing Correction Factor

a6 := .00004354    α6 := 2.222    Calibration Coefficients: **RLSM00.0 Jan 29, 2002**  
a8 := .00002198    α8 := 2.470  
ax := .00001038    αx := 2.762    ax coefficients hole size = 13.375"

crcor\_i := cr\_i · f    Casing Correction

moist\_i := a6 · (crcor\_i)<sup>α6</sup>    Compute moisture  
Hole Size: **6.56 in (OD)**



time := 15    Count times secs.     $\sigma_i := \text{if} \left( cr_i > 0, \frac{100}{\sqrt{cr_i \cdot \text{time}}}, 0 \right)$     Uncertainty (% , 1 sigma)  
out<0> := d -  $\frac{0}{12}$     out<1> := moist    out<2> := cr    out<3> := σ  
WRITEPRN("moist.dat") := out    Moisture (% volume fraction)  
Depth correction may be applied.

6/14/2002

C3832\_Table\_Log-Data.xls

Moist Depth	C3832		uncer c/s	TX-104		WID C3832		K-40		Uncer		Nat.Th		Uncer		Cs-137		Co-60		U-238		Seq DT		TG		uncer	
	VF-%	c/s		C3832 Depth(ft)	Gross cps	uncer c/s	Depth(ft)	Gross cps	K-40 pCi/g	uncer pCi/g	Nat.U pCi/g	uncer pCi/g	Nat.Th pCi/g	uncer pCi/g	Cs-137 pCi/g	uncer pCi/g	Co-60 pCi/g	uncer pCi/g	U-238 pCi/g	uncer pCi/g	%	%	%	%	%	%	%
0.38	1.057	70.3	3.08	0	105	7.83	6.6	0.56	24	0.38	15	0.34	14	0	10	105	0.88					0	10	105	0.88		
0.63	1.998	93.6	2.669	0.5	182	13.4	5	0.48	19	0.49	14	0.5	12	1	10	152	1.06					1	10	152	1.06		
0.88	3.181	115	2.404	1	162	15.1	4.7	0.86	15	0.69	11	0.15	24	2	9	162	1.09					2	9	162	1.09		
1.13	3.718	124	2.321	1.5	160	14	4.9	0.51	17	0.74	11			3	8	160	1.08					3	8	160	1.08		
1.38	4.217	131	2.256	2	157	13.8	5	0.6	20	0.75	11			4	10	157	1.08					4	10	157	1.08		
1.63	4.487	135	2.225	2.5	153	14.5	4.9	0.55	21	0.53	13			5	10	153	1.07					5	10	153	1.07		
1.88	4.875	140	2.183	3	152	12.8	5.2	0.67	15	0.62	12			6	11	152	1.07					6	11	152	1.07		
2.13	4.764	138	2.195	3.5	153	14.1	4.9	0.54	17	0.56	13			7	10	153	1.07					7	10	153	1.07		
2.38	5.178	144	2.154	4	152	14.1	4.9	0.59	15	0.67	12			8	9	152	1.05					8	9	152	1.05		
2.63	5.101	143	2.161	4.5	153	15.4	4.7	0.87	13	0.7	11			9	9	153	1.06					9	9	153	1.06		
2.88	4.474	135	2.226	4.5	153	13.8	4.9	0.56	16	0.65	12			10	8	153	1.05					10	8	153	1.05		
3.13	4.639	137	2.208	5	153	13	5.1	0.57	16	0.53	13			11	10	153	1.07					11	10	153	1.07		
3.38	4.429	134	2.231	5.5	153	13	5.1	0.57	16	0.53	13			12	9	146	1.03					12	9	146	1.03		
3.63	3.828	125	2.306	6	148	12.3	5.2	0.7	14	0.57	13			13	12	148	1.06					13	12	148	1.06		
3.88	4.587	136	2.214	6.5	148	13.5	5.1	0.67	15	0.62	12			14	9	146	1.03					14	9	146	1.03		
4.13	5.158	143	2.156	7	146	14.2	4.9	0.55	16	0.74	11			15	6	141	1					15	6	141	1		
4.38	4.993	141	2.172	7.5	141	12.2	5.2	0.52	17	0.65	12			16	8	141	1.01					16	8	141	1.01		
4.63	4.721	138	2.199	8	141	12	5.3	0.64	14	0.51	13			17	8	142	1.02					17	8	142	1.02		
4.88	5.023	142	2.169	8.5	142	12.7	5.2	0.58	16	0.55	13			18	7	142	1.01					18	7	142	1.01		
5.13	4.914	140	2.18	9	142	13.4	5	0.61	15	0.59	12			19	9	141	1.02					19	9	141	1.02		
5.38	4.639	137	2.208	9.5	141	11.7	5.4	0.57	16	0.51	13			20	7	140	1					20	7	140	1		
5.63	4.754	138	2.196	10	140	12.7	5.1	0.54	16	0.8	10			21	6	140	1					21	6	140	1		
5.88	4.882	140	2.183	10.5	140	12.4	5.1	0.54	16	0.7	11			22	6	140	1					22	6	140	1		
6.13	4.785	139	2.193	11	140	12.6	5.1	0.49	22	0.75	11			23	8	142	1.02					23	8	142	1.02		
6.38	4.982	141	2.173	11.5	142	12.6	5.2	0.56	16	0.48	14			24	8	145	1.02					24	8	145	1.02		
6.63	5.339	146	2.139	12	145	12	5.3	0.95	12	0.48	14			25	8	143	1.02					25	8	143	1.02		
6.88	4.993	141	2.172	12.5	143	11.9	5.3	0.82	15	0.67	12			26	5	149	1.02					26	5	149	1.02		
7.13	5.061	142	2.165	13	149	12.8	5	0.52	17	0.58	12			27	6	151	1.03					27	6	151	1.03		
7.38	4.855	140	2.185	13.5	151	14	4.8	0.52	17	0.66	12			28	6	145	1.02					28	6	145	1.02		
7.63	4.984	141	2.173	14	145	12.4	5.1	0.56	16	0.65	12			29	5	145	1.01					29	5	145	1.01		
7.88	4.899	140	2.181	14.5	145	13	5	0.49	16	0.77	11			30	7	143	1.01					30	7	143	1.01		
8.13	4.992	141	2.172	15	143	12.9	5	0.59	15	0.58	12			31	5	145	1.01					31	5	145	1.01		
8.38	4.689	137	2.203	15.5	145	13.2	4.9	0.48	16	0.61	12			32	5	144	1.01					32	5	144	1.01		
8.63	5.207	144	2.151	16	144	14.1	4.8	0.61	15	0.61	12			33	7	143	1.01					33	7	143	1.01		
8.88	5.775	151	2.102	16.5	143	12.3	5.2	0.48	18	0.56	13			34	7	140	1					34	7	140	1		
9.13	5.779	151	2.101	17	140	12.1	5.2	0.67	14	0.57	12			35	5	139	0.99					35	5	139	0.99		
9.38	5.425	147	2.132	17.5	139	12.9	5	0.75	17	0.49	13			36	6	142	1					36	6	142	1		
9.63	5.865	152	2.094	18	142	12.2	5.2	0.62	19	0.6	12			37	5	143	1					37	5	143	1		
9.88	5.941	153	2.088	18.5	143	12.5	5.1	0.58	16	0.71	11			38	5	148	1.02					38	5	148	1.02		
10.13	5.546	148	2.121	19	148	14.4	4.7	0.66	14	0.69	11			39	7	149	1.03					39	7	149	1.03		
10.38	6.002	154	2.084	19.5	149	13.9	4.9	0.62	15	0.74	11			40	5	150	1.02					40	5	150	1.02		
10.63	6.056	154	2.079	20	150	13.2	4.9	0.68	14	0.77	11			41	5	151	1.03					41	5	151	1.03		
10.88	5.597	149	2.117	20.5	151	13.7	4.9	0.63	19	0.58	12			42	5	150	1.02					42	5	150	1.02		
11.13	5.56	148	2.12	21	150	12.9	5	0.55	16	0.51	13			43	4	150	1.02					43	4	150	1.02		
11.38	4.547	136	2.218	21.5	150	13.2	4.9	0.56	16	0.66	11			44	5	159	1.06					44	5	159	1.06		
11.63	4.261	132	2.251	22	159	14.8	4.7	0.74	14	0.56	13			45	5	172	1.1					45	5	172	1.1		
11.88	3.599	122	2.338	22.5	172	15.8	4.5	0.73	14	0.78	11			46	5	172	1.1					46	5	172	1.1		
12.13	3.172	115	2.405	23	170	15.1	4.6	0.53	17	0.8	10			47	5	170	1.09					47	5	170	1.09		
12.38	3.18	115	2.404	23.5	170	15.4	4.6	0.68	15	0.93	9.7			48	5	159	1.06					48	5	159	1.06		
12.63	2.85	110	2.464	24	159	14.6	4.7	0.5	17	0.63	12			49	5	147	1.02					49	5	147	1.02		
12.88	2.894	110	2.457	24.5	147	12.6	5.1	0.57	15	0.71	11			50	4	148	1.01					50	4	148	1.01		
13.13	3.295	117	2.385	25	148	12.4	5.1	0.68	14	0.68	11																

**51-00-03 (299-W15-67) TX Tank Farm, Moisture: MB71****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-00-03

Log Type: Moisture Gauge

Hanford ID: 299-W15-67

**Borehole Information**

Well ID	<u>A7368</u>	Water Depth	<u>None</u> ft	Total Depth	<u>150</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>207.782</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>8</u> in I.D.	Depth Interval	<u>0 to 150</u> ft	Thickness	<u>0.313</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 14, 2002	MB71Raw
Logging Engineers	J. E. Meisner	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 150 ft	Prefix MB71
	150 to 135 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

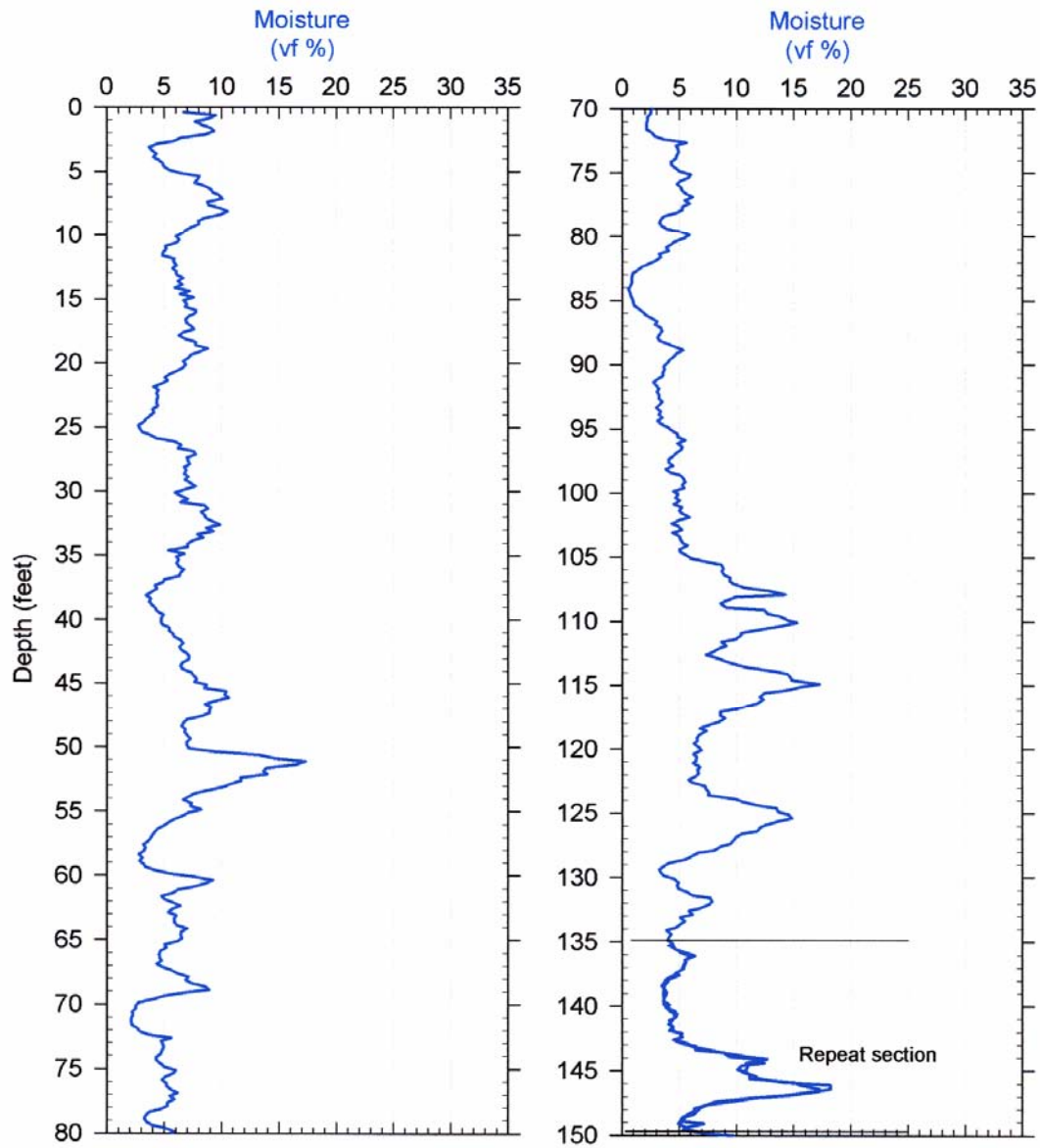
Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is good and identifies relative changes in moisture content. Spectra MB711603 (149.5 ft) of repeat survey had possible tool noise present in the spectra and was remove for processing. The main survey spectra did not contain the noise.	

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: Tx Tank Farm  
Borehole: 51-00-03

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-00-03  
Log Dates: February 14, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Spectra MB711603 (149.5 ft) of repeat survey had possible tool noise present in the low energy portion of the spectra. The main survey spectra did not contain the noise. The excess counts were removed from this individual spectrum for moisture content computation.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 8-inch casing (0.313 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 734 and 733 c/s respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 150 to 135 feet, shows good agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-00-06 (299-W15-69) TX Tank Farm, Moisture: MB74****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-00-06

Log Type: Moisture Gauge

Hanford ID: 299-W15-69

**Borehole Information**

Well ID	<u>A7370</u>	Water Depth	<u>None</u> ft	Total Depth	<u>150</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.719</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>8</u> in I.D.	Depth Interval	<u>0 to 150</u> ft	Thickness	<u>0.313</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 19, 2002	MB74Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 146.7 ft	Prefix MB74
	146.7 to 131.7 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is good and identifies relative changes in moisture content.	

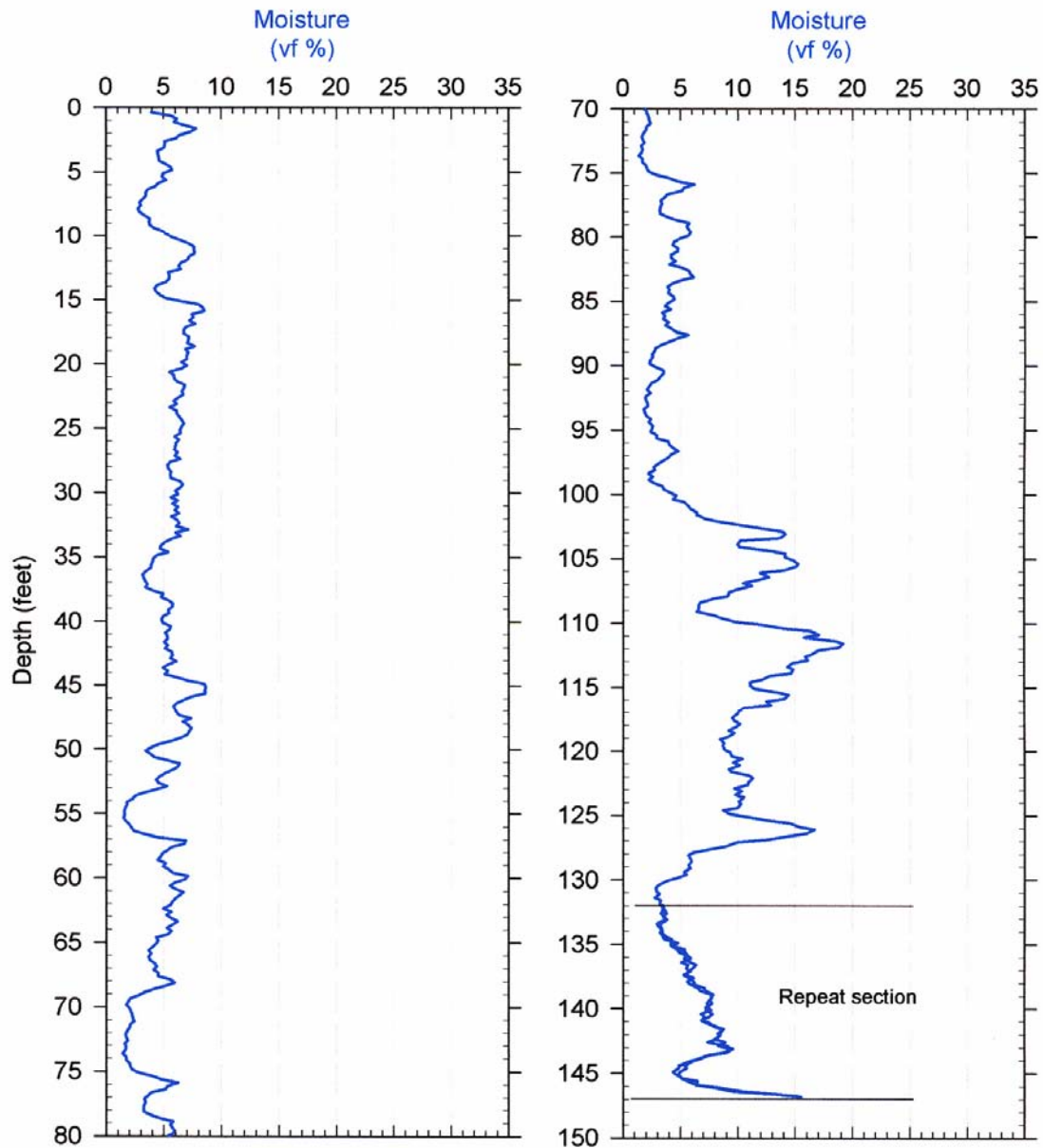


## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: Tx Tank Farm  
Borehole: 51-00-06

Log Date: February 2002  
Depth Datum: Top Casing





## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-00-06  
Log Dates: February 19, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 8-inch casing (0.313 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 728 and 730 c/s respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 146.7 to 131.7 feet, shows good agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-00-07 (299-W15-73) TX Tank Farm, Moisture: MB58****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-00-07

Log Type: Moisture Gauge

Hanford ID: 299-W15-73

**Borehole Information**

Well ID	<u>A7374</u>	Water Depth	<u>None</u> ft	Total Depth	<u>150</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.078</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>8</u> in I.D.	Depth Interval	<u>0 to 150</u> ft	Thickness	<u>0.313</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 7, 2002	MB58Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 149.4 ft	Prefix MB58
	149.4 to 134.5 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

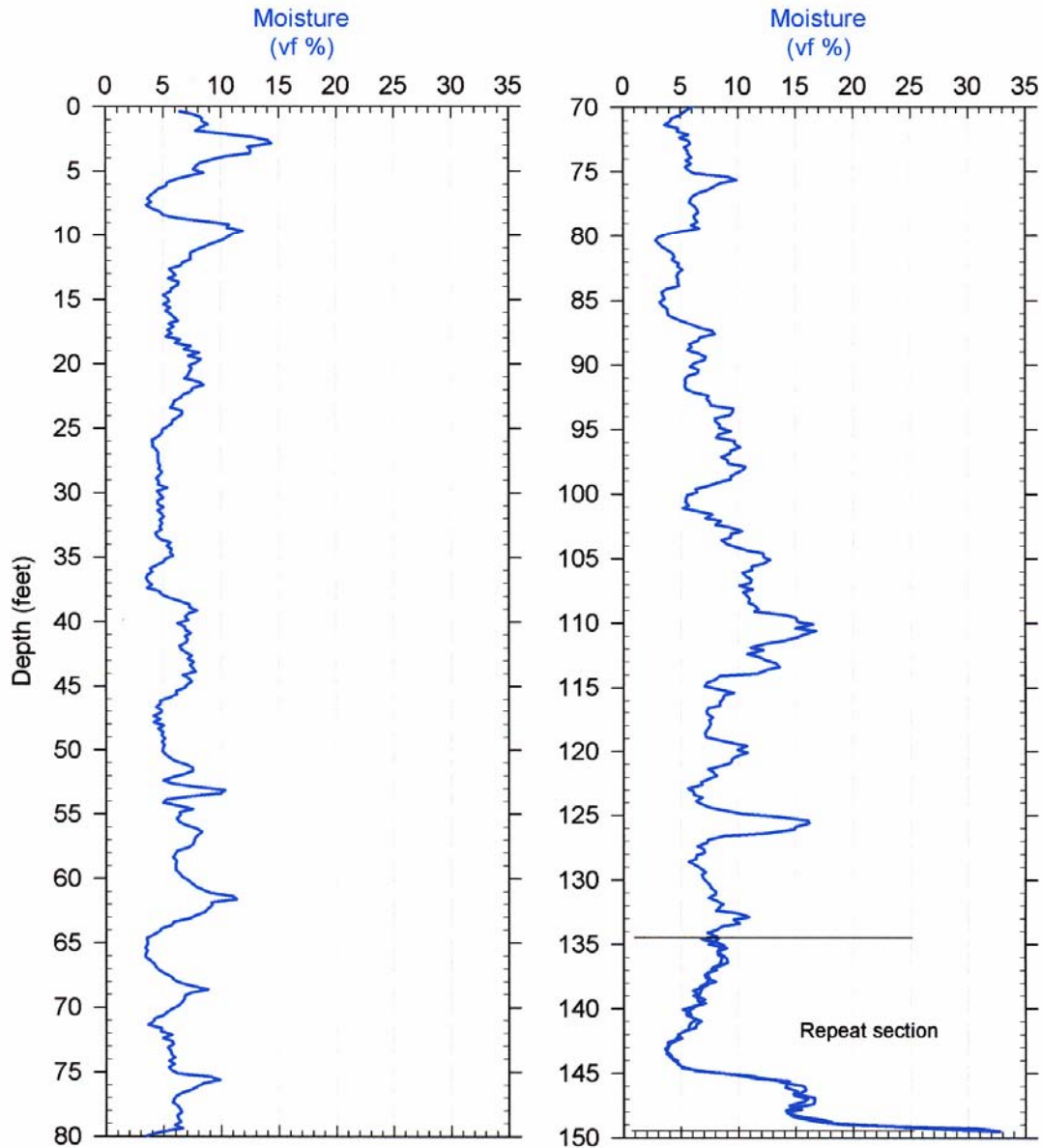
Notes: The repeatability (precision) of the moisture gauge measurement is good and identifies relative changes in moisture content. Moisture increase at bottom of borehole is typical of water (moisture) in the bottom of the borehole, even though no free-water was measured with the e-tape.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: Tx Tank Farm  
Borehole: 51-00-07

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-00-07  
Log Dates: February 7, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Moisture log has an increase at bottom of borehole, which is typical of water in the bottom of the borehole. However, since no free-water was measured with the e-tape, the moisture detected by the probe must not include free-water inside the borehole.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 8-inch casing (0.313 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 718 and 717 c/s respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 149.4 to 134.5 feet, shows good agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-02-02 (299-W15-170) TX Tank Farm, Moisture: MB68****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-02-02

Log Type: Moisture Gauge

Hanford ID: 299-W15-170

**Borehole Information**

Well ID	<u>A7468</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>206.050</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 12, 2002	MB68Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 98.3 ft	Prefix MB68
	98.3 to 83 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

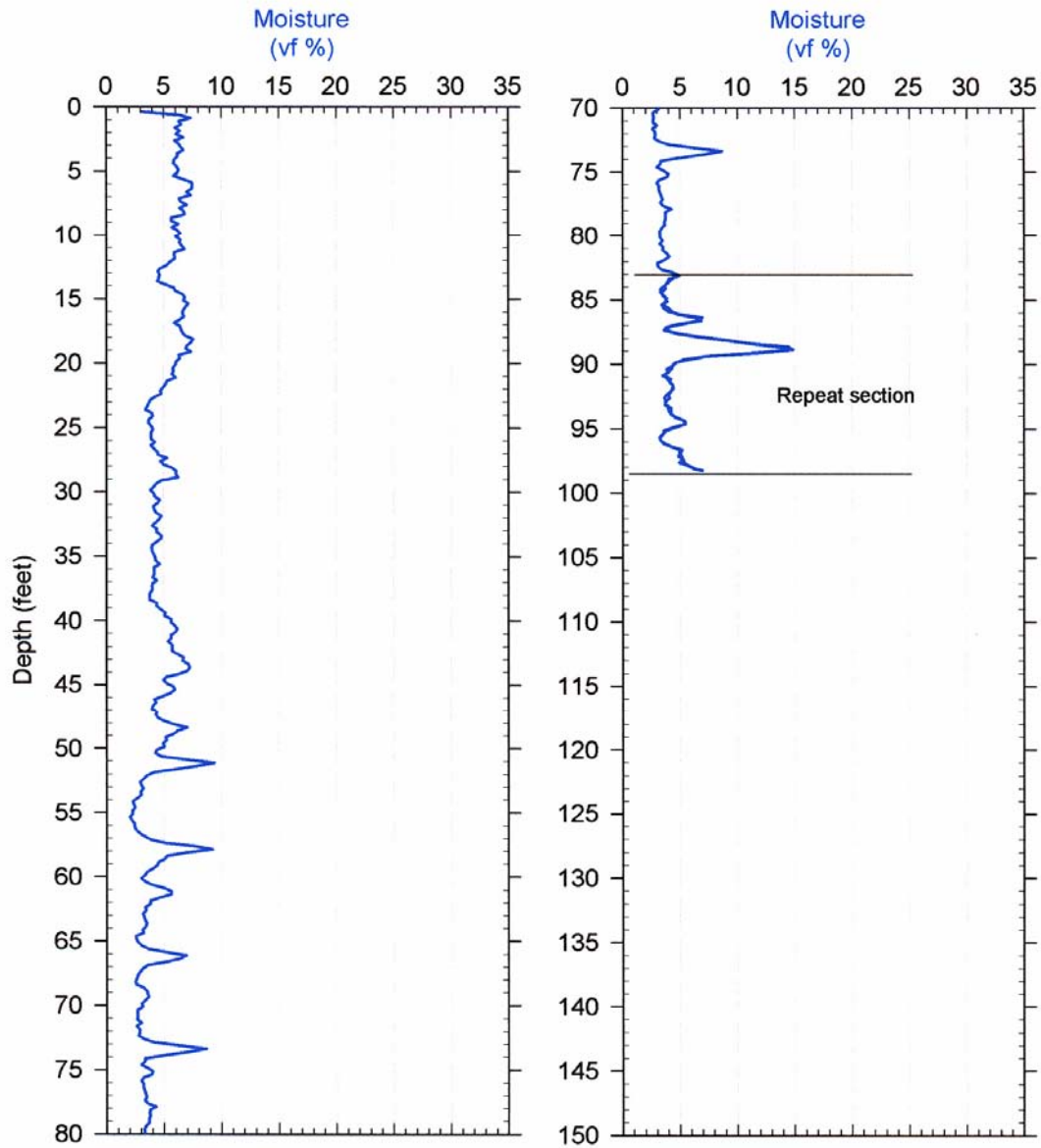
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-02-02

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-02-02  
Log Dates: February 12, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 756 and 715 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 94 to 83 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-03-01 (299-W15-192) TX Tank Farm, Moisture: MB65****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-03-01

Log Type: Moisture Gauge

Hanford ID: 299-W15-192

**Borehole Information**

Well ID	<u>A7490</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.842</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 11, 2002	MB65Raw
Logging Engineers	J. E. Meisner	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 98.5 ft	Prefix MB65
	98.5 to 85 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content. Very high apparent moisture encountered in two zones above 25 feet.

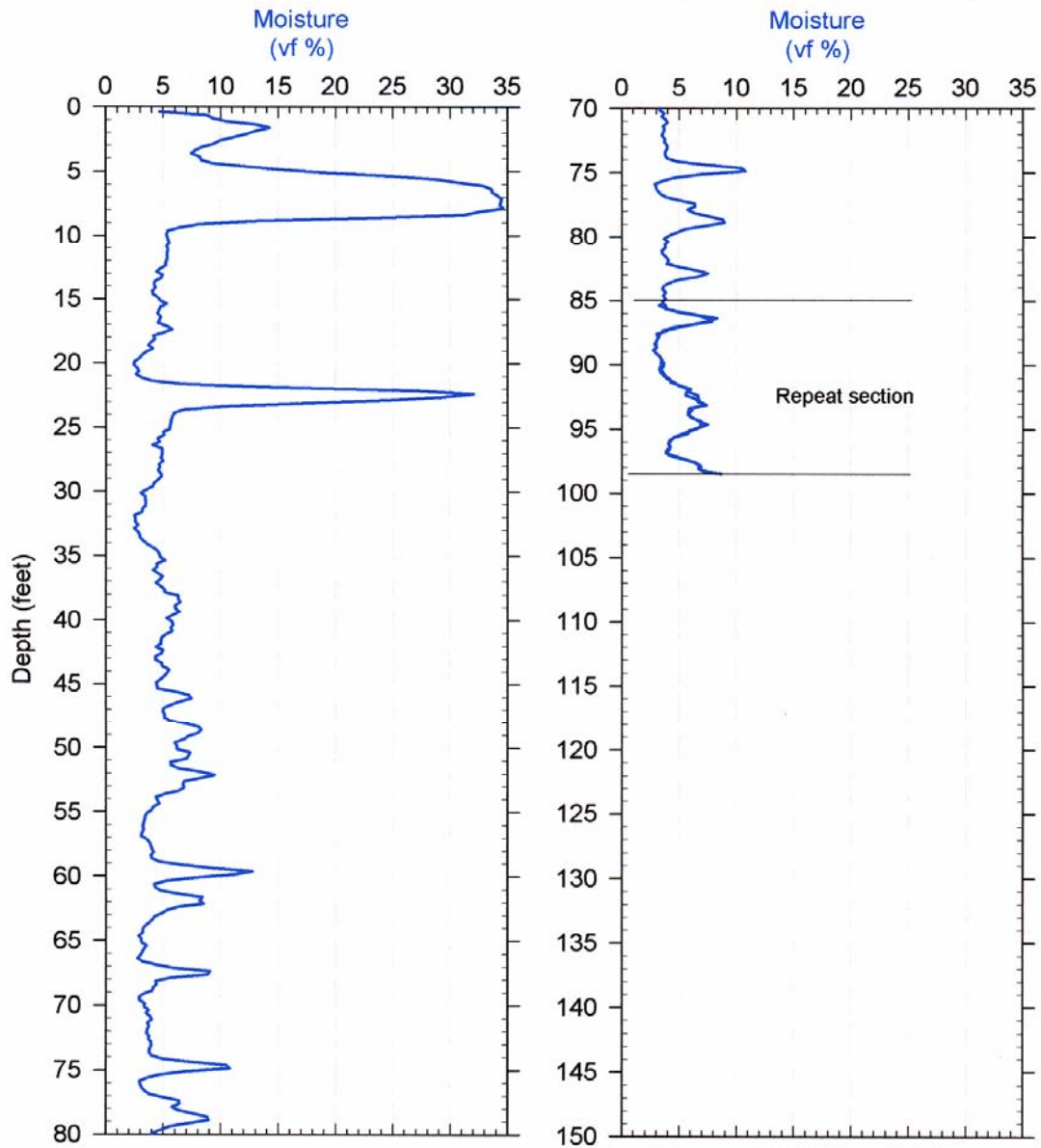


## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-03-01

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-03-01  
Log Dates: February 11, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Very high apparent moisture encountered in two zone above 25 feet. Other boreholes in the area also had high moisture (51-03-11, 51-04-02, and 51-04-06)

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 735 and 720 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 98 to 85 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-03-02 (299-W15-71) TX Tank Farm, Moisture: MB66, MB67****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-03-02

Log Type: Moisture Gauge

Hanford ID: 299-W15-71

**Borehole Information**

Well ID	<u>A7372</u>	Water Depth	<u>None</u> ft	Total Depth	<u>150</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.888</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>8</u> in I.D.	Depth Interval	<u>0 to 150</u> ft	Thickness	<u>0.313</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 11-12, 2002	MB66Raw, MB67Raw
Logging Engineers	J. E. Meisner	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 94 ft	Prefix MB66
	89 to 145 ft	Prefix MB67
	145 to 133 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

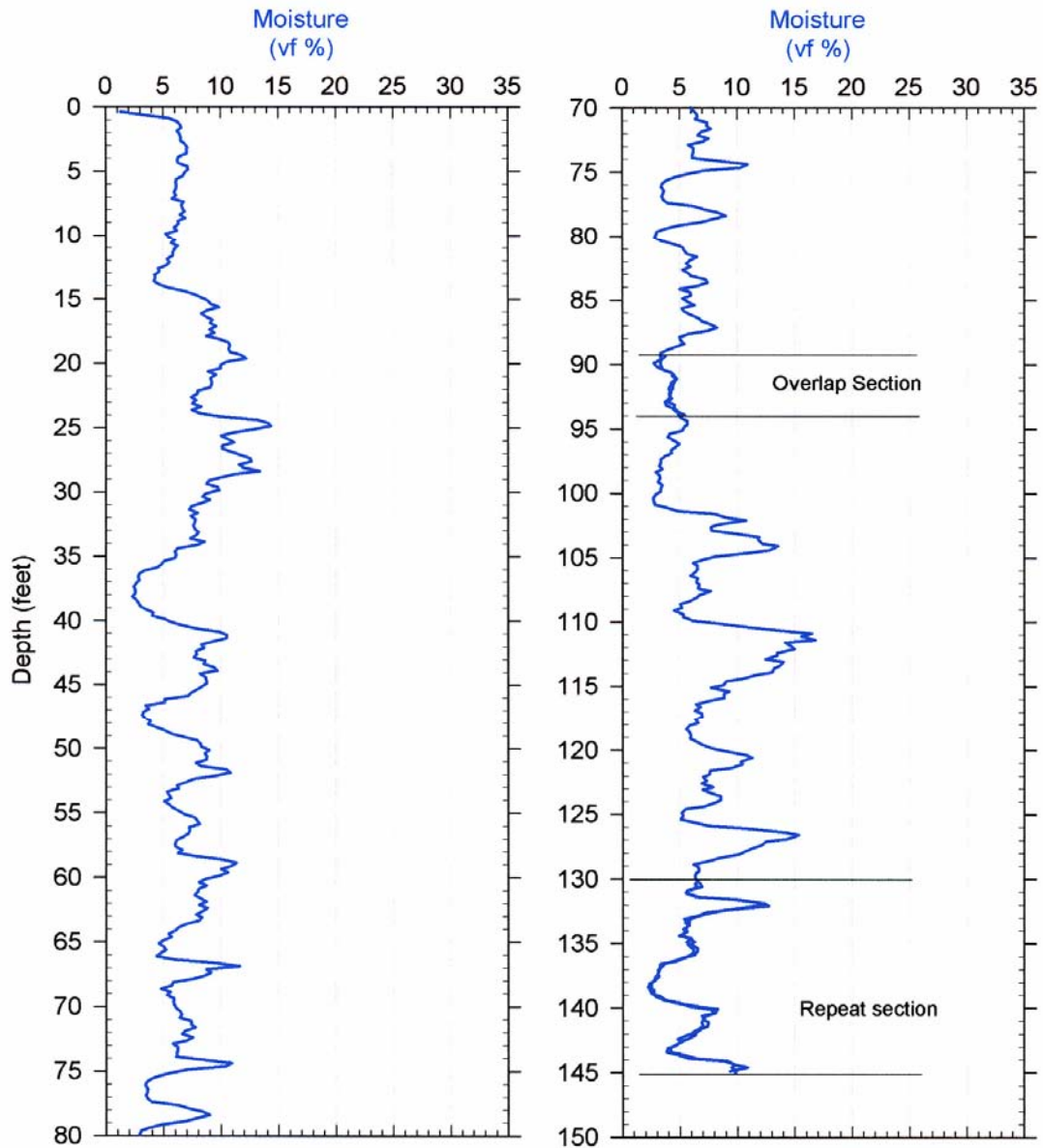
Notes: The repeatability (precision) of the moisture gauge measurement is good and identifies relative changes in moisture content.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-03-02

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-03-02  
Log Dates: Feb. 11-12, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 8-inch casing (0.313 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were (735, 720 c/s on 2/11/2002) and (756, 730 c/s on 2/12/2002). The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 145 to 130 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-03-09 (299-W15-128) TX Tank Farm, Moisture: MB72, MB73****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-03-09

Log Type: Moisture Gauge

Hanford ID: 299-W15-128

**Borehole Information**

Well ID	<u>A7427</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.744</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 14&19, 2002	MB72Raw,MB73Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 81 ft	Prefix MB72
	75 to 98 ft	Prefix MB73
	98 to 88 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

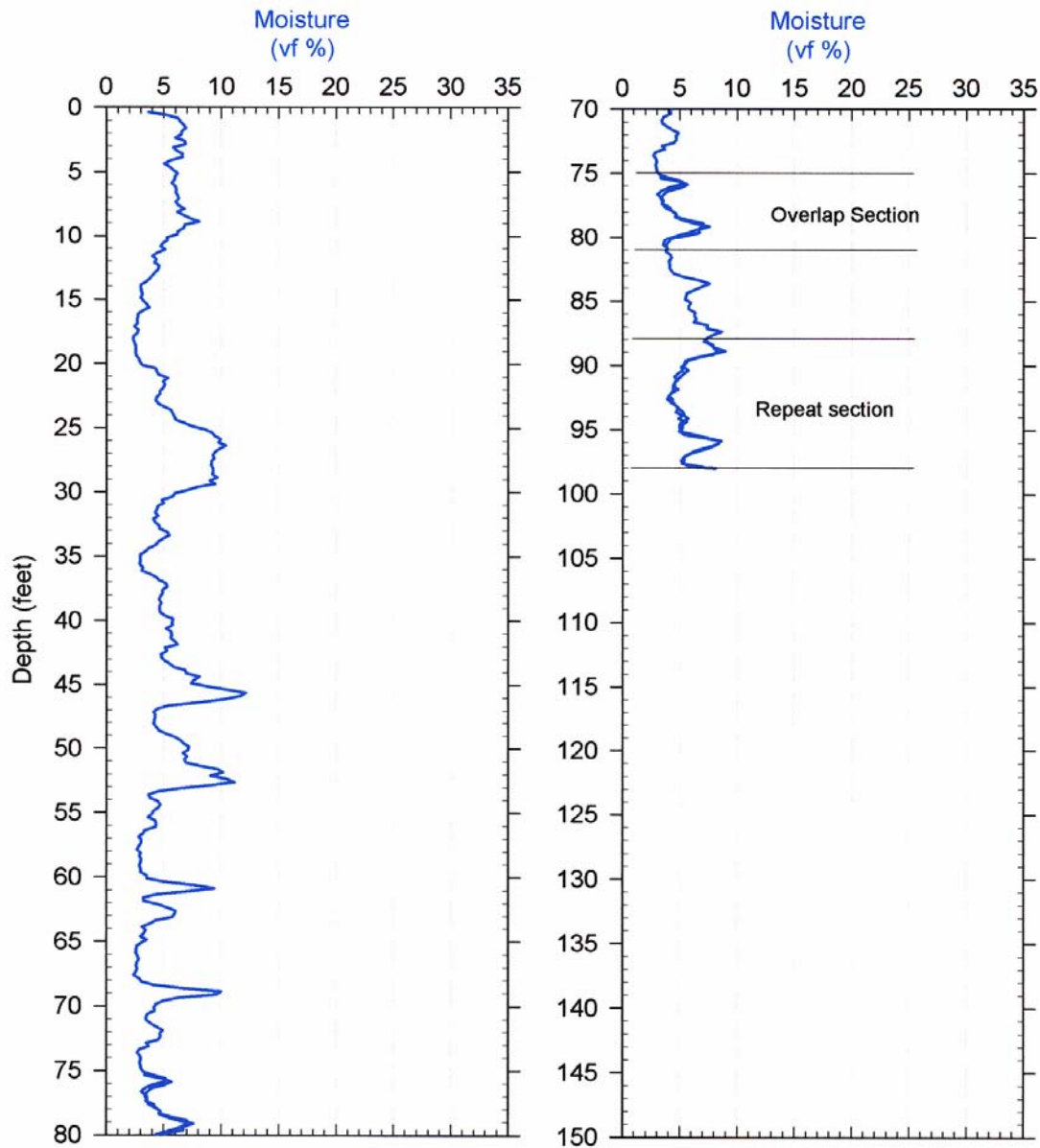
Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content.	

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-03-09

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-03-09  
Log Dates: Feb. 14&19, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were (734, 733 c/s on 2/14/2002) and (728, 730 c/s on 2/19/2002). The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval (98 to 88 feet) and overlap interval (75 to 81 feet) show excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics



**51-03-11 (299-W15-191) TX Tank Farm, Moisture: MB62****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-03-11

Log Type: Moisture Gauge

Hanford ID: 299-W15-191

**Borehole Information**

Well ID	<u>A7489</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.719</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>        </u> in I.D.	Depth Interval	<u>        </u> ft	Thickness	<u>        </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 8, 2002	MB62Raw
Logging Engineers	R. K. Price	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 99.8 ft	Prefix MB62
	99 to 84 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

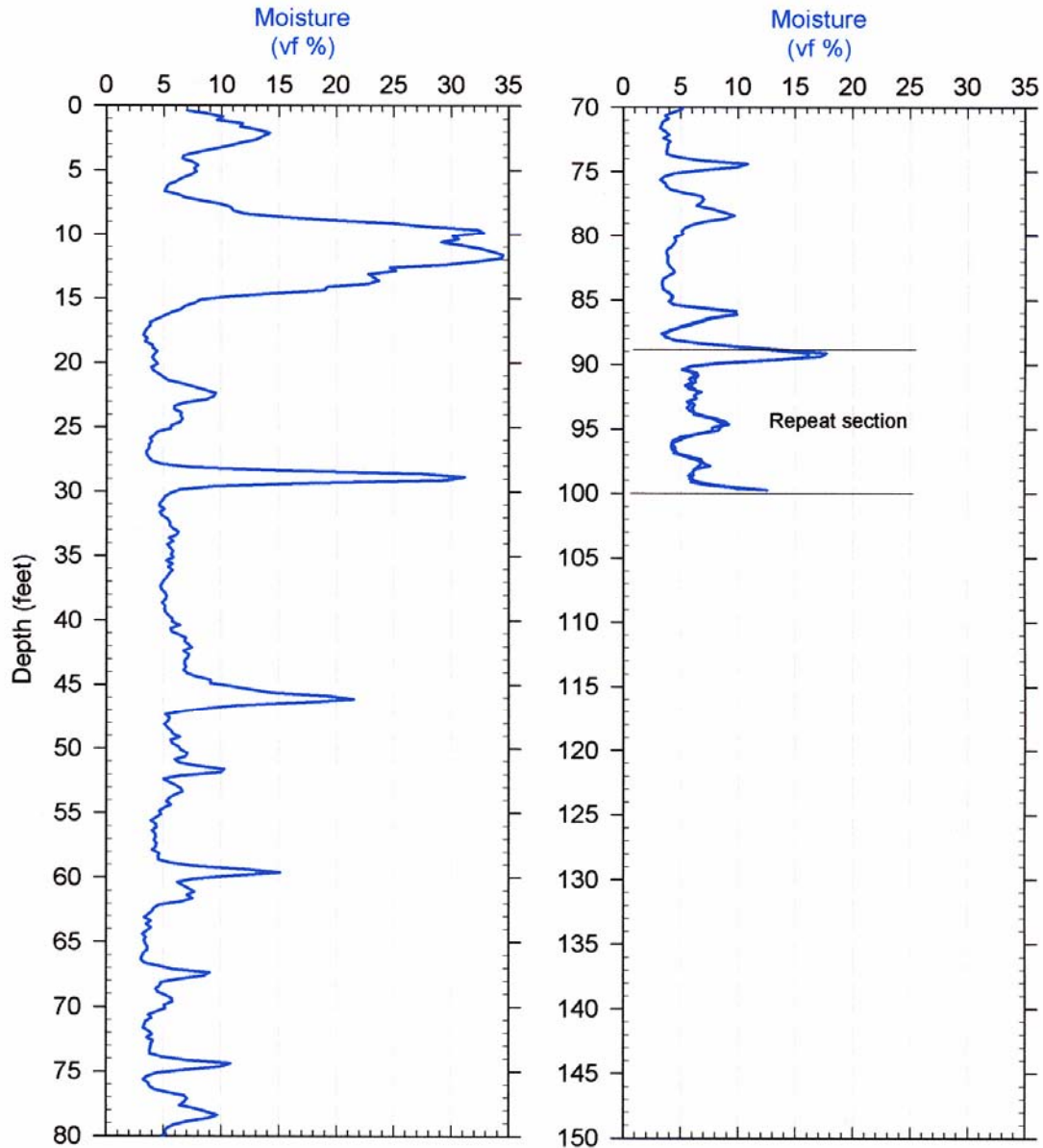
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content. Very high apparent moisture encountered in two zones above 30 feet.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-03-11

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-03-11  
Log Dates: February 8, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Very high apparent moisture encountered in two zone above 30 feet. Other boreholes in the area also had high moisture (51-03-01, 51-04-02, and 51-04-06)

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 741 and 720 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 99 to 84 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

51-03-12 (299-W15-126) TX Tank Farm, Moisture: MB63, MB64

**Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-03-12

Log Type: Moisture Gauge

Hanford ID: 299-W15-126

**Borehole Information**

Well ID	<u>A7425</u>	Water Depth	<u>None</u> ft	Total Depth	<u>105</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.783</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 105</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 8&11, 2002	MB63Raw,MB64Raw
Logging Engineers	R.K. Price & J. E. Meisner	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 20 ft	Prefix MB63
	15 to 100.6 ft	Prefix MB64
	100.5 to 86 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

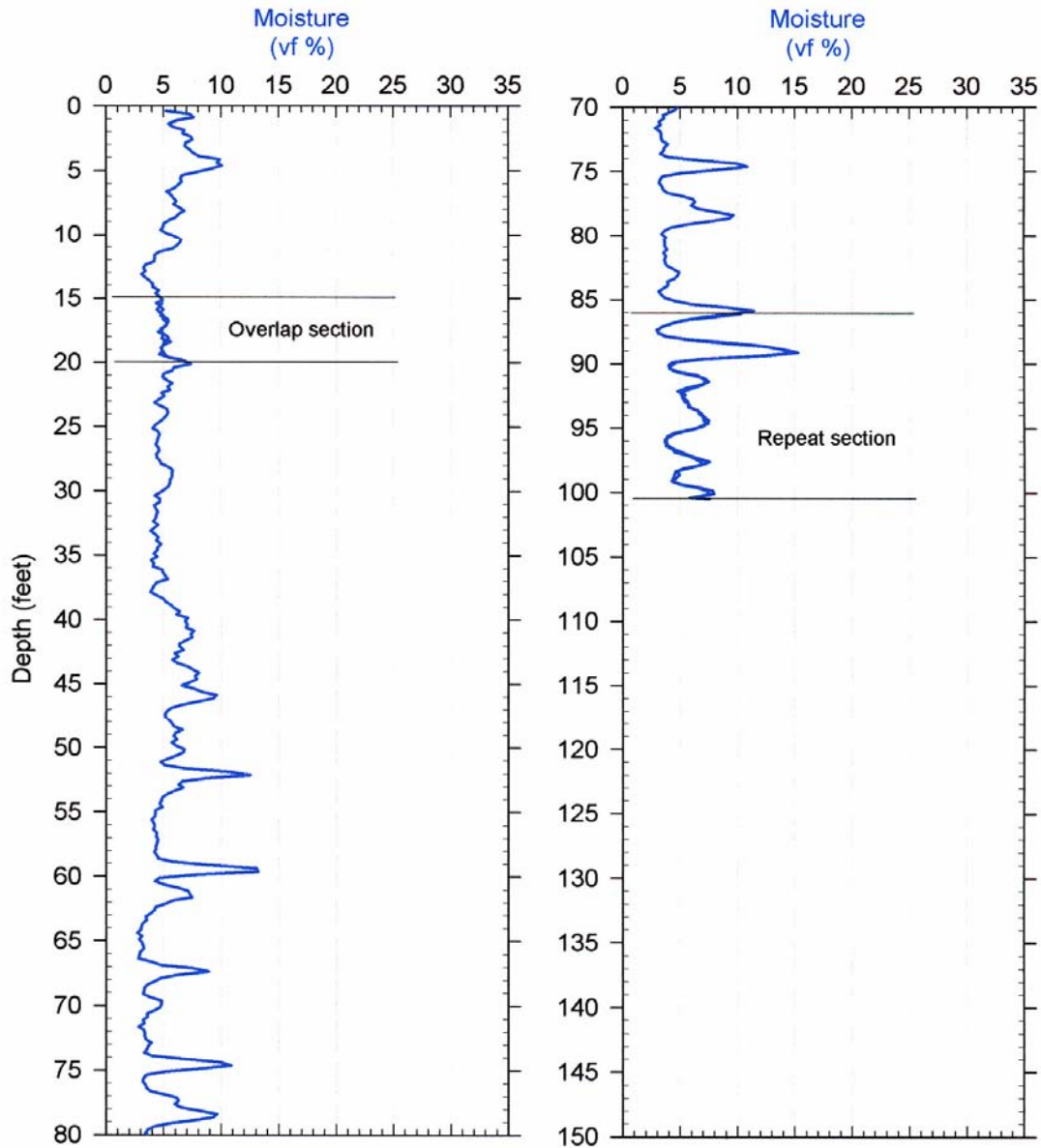
Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content.	

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-03-12

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-03-12  
Log Dates: Feb. 8&11, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were (741, 720 c/s on 2/8/2002) and (735, 720 c/s on 2/11/2002). The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval (100.5 to 86 feet) and overlap interval (15 to 20 feet) show excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-04-02 (299-W15-153) TX Tank Farm, Moisture: MB75****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-04-02

Log Type: Moisture Gauge

Hanford ID: 299-W15-153

**Borehole Information**

Well ID	<u>A7451</u>	Water Depth	<u>93.55</u> ft	Total Depth	<u>105</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.556</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 105</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>        </u> in I.D.	Depth Interval	<u>        </u> ft	Thickness	<u>        </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 19, 2002	MB75Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 93.5 ft	Prefix MB75
	93.2 to 83.2 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

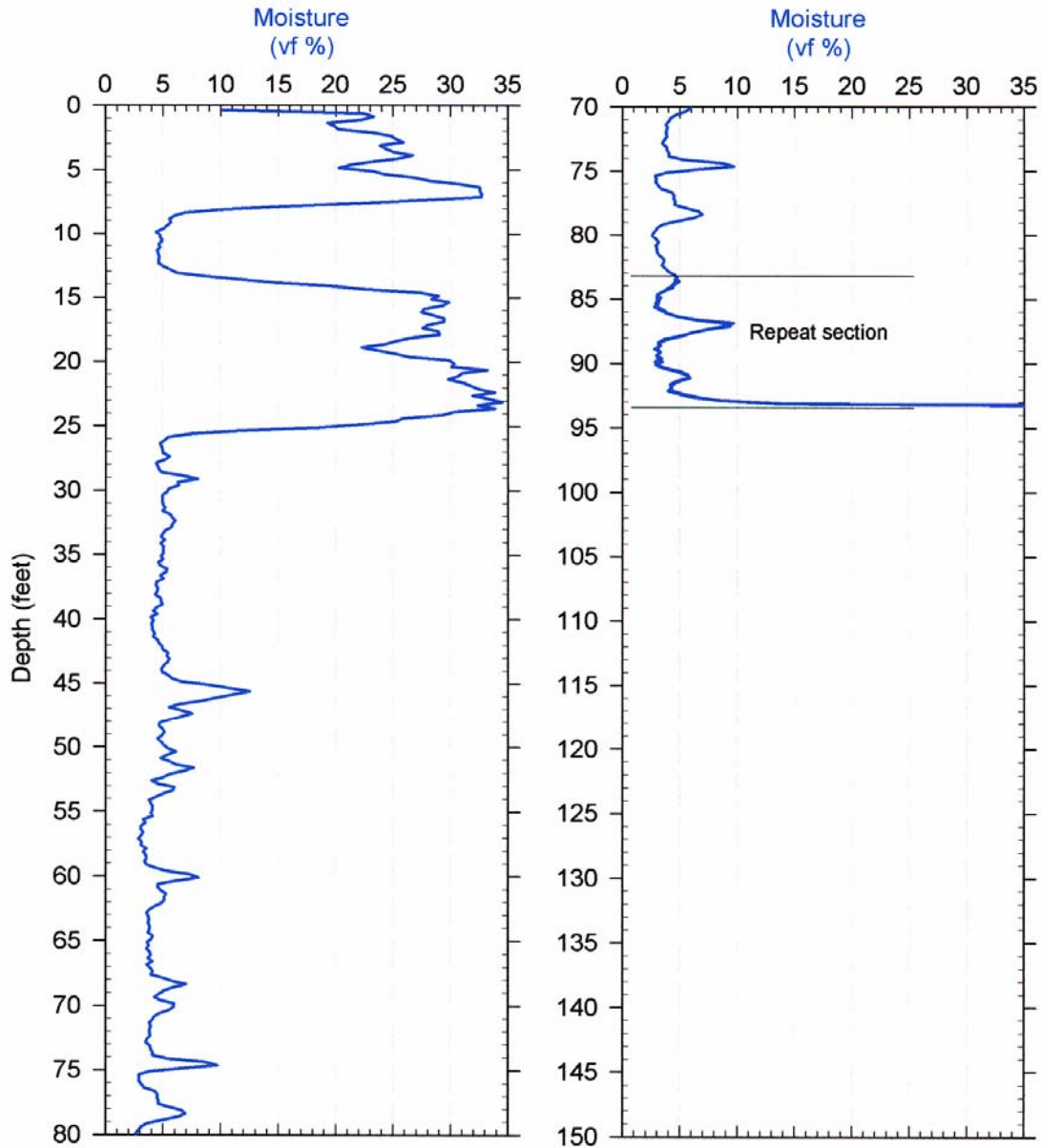
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content. Very high apparent moisture encountered in two zones above 25 feet.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-04-02

Log Date: February 2002  
Depth Datum: Top Casing





## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-04-02  
Log Dates: February 19, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Very high apparent moisture encountered in two zone above 25 feet. Other boreholes in the area also had high moisture (51-03-01, 51-03-11, and 51-04-06)

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 728 and 730 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 93.2 to 83.2 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-04-05 (299-W15-130) TX Tank Farm, Moisture: MB61****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-04-05

Log Type: Moisture Gauge

Hanford ID: 299-W15-130

**Borehole Information**

Well ID	<u>A7429</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.506</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 8, 2002	MB61Raw
Logging Engineers	R. K. Price	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 99.2 ft	Prefix MB61
	99 to 84 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

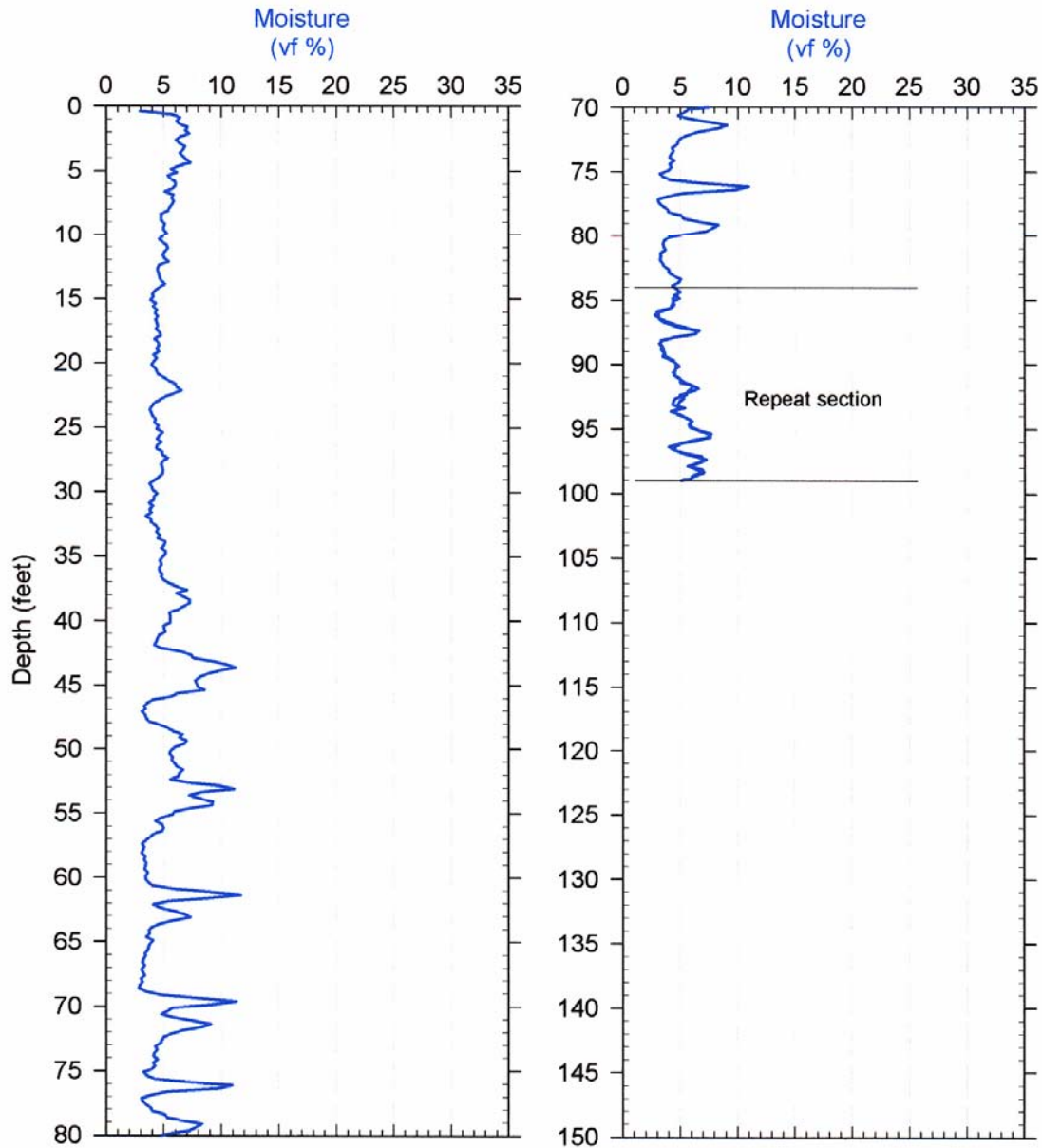
Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content.	

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-04-05

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-04-05  
Log Dates: February 8, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 741 and 720 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 99 to 84 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

51-04-06 (299-W15-154) TX Tank Farm, Moisture: MB59, MB60

**Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-04-06

Log Type: Moisture Gauge

Hanford ID: 299-W15-154

**Borehole Information**

Well ID	<u>A7452</u>	Water Depth	<u>94.9</u> ft	Total Depth	<u>105</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>205.385</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 105</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>        </u> in I.D.	Depth Interval	<u>        </u> ft	Thickness	<u>        </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 7-8, 2002	MB59Raw,MB60Raw
Logging Engineers	R. Z. Steffler & R. K. Price	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 60 ft	Prefix MB59
	55 to 94.8 ft	Prefix MB60
	94.7 to 80 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

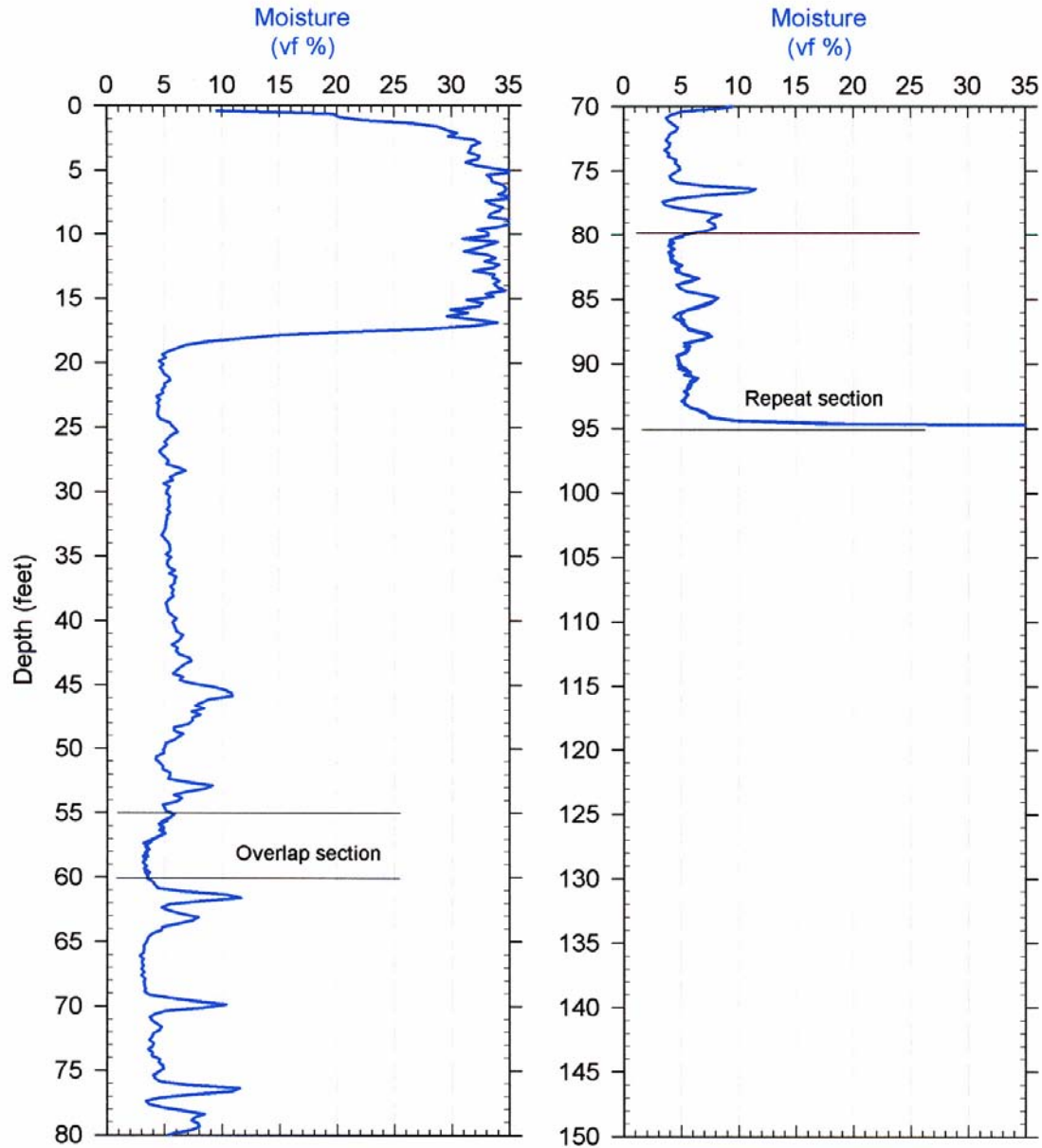
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content. Very high apparent moisture encountered in a zone above 20 feet.

## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-04-06

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-04-06  
Log Dates: February 19, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content. Very high apparent moisture encountered in a zone above 20 feet. Other boreholes in the area also had high moisture (51-03-01, 51-03-11, and 51-04-02)

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were (718, 717 c/s on 2/7/2002) and (741, 720 c/s on 2/8/2002). The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval (94.7 to 80 feet) and overlap interval (55 to 60 feet) show excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-05-05 (299-W15-145) TX Tank Farm, Moisture: MB70****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-05-05

Log Type: Moisture Gauge

Hanford ID: 299-W15-145

**Borehole Information**

Well ID	<u>A7444</u>	Water Depth	<u>None</u> ft	Total Depth	<u>100</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>206.707</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 100</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>        </u> in I.D.	Depth Interval	<u>        </u> ft	Thickness	<u>        </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 13, 2002	MB70Raw
Logging Engineers	R. Z. Steffler	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 98.5 ft	Prefix MB70
	98.5 to 83.5 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002
Notes: The repeatability (precision) of the moisture gauge measurement is excellent and identifies relative changes in moisture content.	

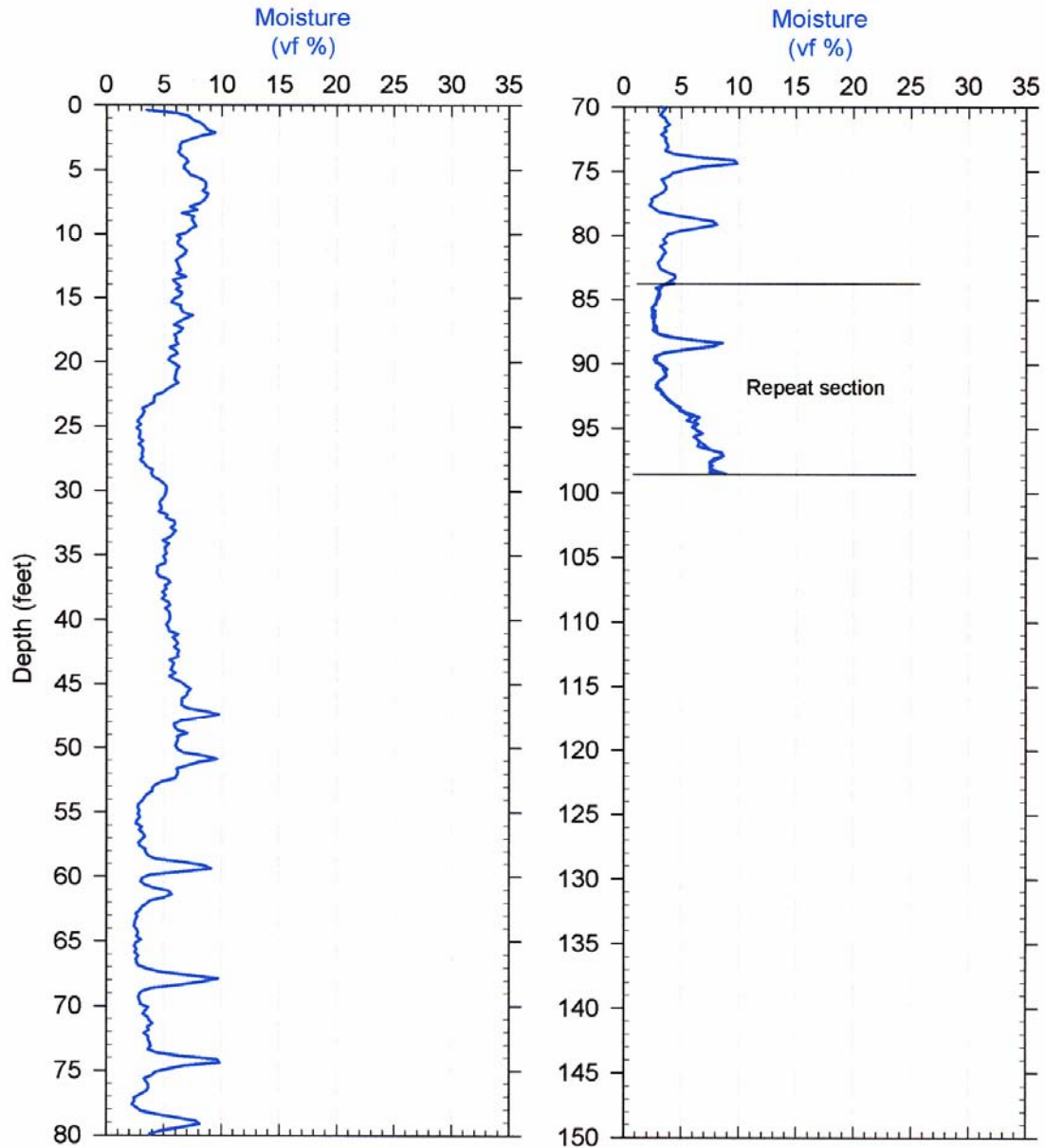


## RLS Neutron-Neutron Moisture

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Borehole: 51-05-05

Log Date: February 2002  
Depth Datum: Top Casing



## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-05-05  
Log Dates: February 13, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 728 and 734 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.

**Repeat Interval:** The repeat interval, 98.5 to 83.5 feet, shows excellent agreement. The logging system performed according to specifications.

Analysis by: Pacific Northwest Geophysics

**51-05-07 (299-W15-171) TX Tank Farm, Moisture: MB69****Neutron-Neutron Moisture Borehole Survey**

Duratek Federal Services, Inc.

**Log Header**

Project: TX Tank Farm

Borehole: 51-05-07

Log Type: Moisture Gauge

Hanford ID: 299-W15-171

**Borehole Information**

Well ID	<u>A7469</u>	Water Depth	<u>None</u> ft	Total Depth	<u>110</u> ft
Elevation Reference	<u>Top Casing</u>	Elevation	<u>206.199</u> M		
Depth Reference	<u>Top Casing</u>	Casing Stickup	<u>0.0</u> ft		
Casing Diameter	<u>6</u> in I.D.	Depth Interval	<u>0 to 110</u> ft	Thickness	<u>0.28</u> in
Casing Diameter	<u>      </u> in I.D.	Depth Interval	<u>      </u> ft	Thickness	<u>      </u> in

**Logging Information**

Log Type	Moisture Gauge	
Company	Duratek Federal Services	
Date/Archive File Name	Feb 13, 2002	MB69Raw
Logging Engineers	J. E. Meisner	
Instrument Series	RLSM00.0	
Logging Unit	RLS3	
Depth Interval	0 to 107 ft	Prefix MB69
	107 to 92 ft	Repeat
Instrument Calibration Date	January 29, 2002	
Calibration Report	WHC-SD-EN-TI-306, Rev. 0	

**Analysis Information**

Company	Pacific Northwest Geophysics
Analyst	Randall Price
Date	February 25, 2002

Notes: The repeatability (precision) of the moisture gauge measurement is good and identifies relative changes in moisture content.

## Moisture Log Analysis & Summary

Duratek Federal Services, Inc.

Project: TX Tank Farm  
Log Type: Moisture Gauge

Well ID: 51-05-07  
Log Dates: February 13, 2002

### **General Notes:**

The precision (repeatability) of the moisture gauge survey is appropriate for identifying relative changes in moisture content.

**Environmental Corrections:** The drilling method and insufficient stick-up above the cement collar compromised attempts to measure casing thickness during logging operation. As an alternative, the thickness for schedule-40 6-inch casing (0.280 inch) was used. Since the thickness for the borehole casing is the same as the moisture calibration models, no casing thickness correction was required.

Density of the formation is assumed to be similar to the density of the moisture calibration models (1.70 to 1.76 g/cc). No formation density correction has been applied to the raw survey data.

**Depth Reference:** Zero depth reference of log survey is at top of casing.

**System Performance Verification:** The pre- and post-log verification measurements were 715 and 730 c/s, respectively. The system verification check measurements are consistent with previous system performance checks and within the normal observed range of 710 to 760 c/s.


**Repeat Interval:** The repeat interval, 107 to 92 feet, shows good agreement. The logging system performed according to specifications.

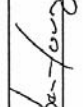
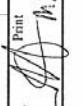
Analysis by: Pacific Northwest Geophysics



**APPENDIX D**  
**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUESTS**

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		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				C.O.C # <b>102214</b>	
Collector <b>YOUNG, K.J.</b>		Contact/Requestor <b>SYDNOR, HAROLD</b>		Tel. No. <b>372-9414</b> MSIN <b>H0-22</b>		Page <b>1</b> of <b>1</b> FAX	
SAF Number <b>S02-046</b>		Sample Origin		Purchase Order/Charge Code			
Project Title <b>TX Borehole (C3830)</b>		Logbook # <b>DFSNW-SAWS-HSS</b>		Ice Chest # <b>SML-10</b>		Temp.	
Shipped To (Lab) <b>AG&amp;G</b>		Method of Shipment <b>Gov Truck</b>		Bill of Lading/Air Bill No.			
Protocol <b>RCRA</b>		Data Turnaround <b>PER CONTRACT</b>		Offsite Property No.			
Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
S02046-01		W	5/12/02	1705	(1) 125 P	IC Anions (EPA 300.0)	Cool to 4°C
S02046-01		W	5/12/02	1705	(1) 500 P	ICP Metals - 6010A (TAL)	HNO3
S02046-01		W	5/12/02	1705	(1) 1000 aG	Semi-VOA (8270)	Cool to 4°C
S02046-01		W	5/12/02	1705	(1) 250 aGs	TOC (9000)	H2SO4
S02046-01		W	5/12/02	1705	(1) 1000 P	Total Alpha / Beta (Lab-Specific), GEA	HNO3
S02046-01		W	5/12/02	1705	(1) 1000 P	Tritium, (H3)	Cool to 4°C
S02046-01		W	5/12/02	1705	(3) 40 aGs	VOA	HCL

POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.		MSDS Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		SPECIAL INSTRUCTIONS		Hold Time	
Relinquished By <b>K.J. Young</b>	Print 	Sign <b>Young</b>	Date/Time <b>5/13/02 1612</b>	Received By 	Print <b>Michael L. Young</b>	Sign <b>Young</b>	Date/Time <b>5/13/02 1612</b>
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
FINAL SAMPLE DISPOSITION				Disposal Method e.g. Return to customer, per lab procedure, used in process.			
Disposed By				Date/Time			
DFNW-SS-010							



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Duratek Federal Services		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# 102218 Page 1 of 1	
Collector	Contact/Requestor: <b>SYBNOB, HAROLD</b>					Tel. No. <b>372-9414</b> MSIN <b>HO-22</b> FAX	
SAF Number	<b>S02-046</b>	<b>C3832</b>	Sample Origin	<b>TX FARM</b>		Purchase Order/Charge Code	
Project Title	<b>TX BOREHOLE (C3830) B7</b>		Logbook #	<b>DFSNWI-SALS-HSS</b>		Ice Chest # <b>Drum #1</b> Temp.	
Shipped To (Lab)	<b>AG + G</b>		Method of Shipment	<b>GOV TRUCK</b>		Bill of Lading/Air Bill No.	
Protocol	<b>RCRA</b>		Data Turnaround	<b>PER CONTRACT</b>		Offsite Property No.	
Sample No.	Lab. ID	Date	No/Type Container	Sample Analysis	Preservative		
S02046-05		5/1/02 0840	(1) Spoon	Per Contract			
S02046-06		5/1/02 1515	(1) Spoon	" "			
			( )				
			( )				
			( )				
			( )				
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			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.				SPECIAL INSTRUCTIONS possible free liquids in sample # S02046-05			
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By			5/1/02 1630	Received By	Ginny Legore		5/1/02 1630
Relinquished By				Received By			
Relinquished By				Received By			
Matrix *				Matrix *			
S = Soil				S = Soil			
SE = Sediment				DL = Drum Solids			
SO = Solid				T = Tissue			
SL = Sludge				WI = Wipe			
W = Water				L = Liquid			
O = Oil				V = Vegetation			
A = Air				X = Other			
Disposal Method e.g. Return to customer, per lab procedure, used in process.				Disposed By			
Date/Time				Date/Time			
FINAL SAMPLE DISPOSITION				DFNW-SS-010			

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							C.O.C.# 102219
							Page    A    of    I
<b>Duratek</b> <small>FOOD &amp; DRUG SERVICES</small>	Collector	Contact/Requestor SYDNOR, HAROLD	Tel. No.	372-9414 MSIN	HO-22/VAX		
MSAF Number S02-046 CC3833]	Sample Origin TX Farm	Purchase Order/Charge Code					
Project Title TX BOREHOLE (3833)	Logbook # DFSNW-SAWS-HSS	Ice Chest # Dm # 1	Temp.				
Shipped To (Lab) AG + G	Method of Shipment Gov. Truck	Bill of Lading/Air Bill No.					
Protocol RCRA	Data Turnaround Per Contract	Offsite Property No.					
Sample No. S02046-07	Lab. ID *	No/Type Container	Sample Analysis	Preservative			
Date 5/13/02	Time 1050	(1) Spoon	Per Contract				
		( )					
		( )					
		( )					
		( )					
		( )					
		( )					
		( )					
		( )					
		( )					
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		( )					
		( )					
		( )					
		( )					
POSSIBLE SAMPLE HAZARDS/REMARKS							
List all known wastes.							
MSDS Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>							
SPECIAL INSTRUCTIONS							
Hold Time							
Relinquished By K.J. Longden	Print Date/Time 5/13/02 1530	Received By M. Valente	Sign Date/Time 5/13/02 1530	Matrix •			
Relinquished By	Print Date/Time	Received By	Sign Date/Time	S = Soil	DS = Drum Solids		
				SE = Sediment	DL = Drum Liquids		
				SO = Solid	T = Tissue		
				SL = Sludge	WI = Wipe		
				W = Water	L = Liquid		
				O = Oil	V = Vegetation		
				A = Air	X = Other		
Relinquished By	Print Date/Time	Received By	Sign Date/Time				
Relinquished By	Print Date/Time	Received By	Sign Date/Time				
Relinquished By	Print Date/Time	Received By	Sign Date/Time				
FINAL SAMPLE DISPOSITION				Disposal Method e.g. Return to customer, per lab procedure, used in process.			
Disposed By				Date/Time			

Duratek FOOD SAFETY SERVICES		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# 102220			
Collector	K.J. Jouns	Contact/Requestor	SYDOR, HAROLD		Tel. No.	372-9414	MSIN	HO-22 FAX	
AF Number	502-046 (13832)	Sample Origin	TX Farm		Purchase Order/Charge Code				
Project Title	TX BOREHOLE (13830) 57	Logbook #	DESHW-SAW-1455		Ice Chest #	Dum # 1			
Shipped To (Lab)	AG + G	Method of Shipment			Bill of Lading/Air Bill No.				
Protocol	ICRA	Data Turnaround	PER CONTRACT		Offsite Property No.				
Sample No.	Lab. ID	* Date	Time	No/Type Container	Sample Analysis	Preservative			
302046-08		5/14/02	0825	(1) Spoon	Per Contract				
302046-09		5/14/02	1340	(1) Spoon	Per Contract				
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
				( )					
POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.					MSDS	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
SPECIAL INSTRUCTIONS					Hold Time				
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *	
Relinquished By	K.J. Jouns	for	5/14/02/1545	Received By	Clark L. ...	for	5/14/02/1545	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other	
Relinquished By			Date/Time	Received By			Date/Time		
Relinquished By			Date/Time	Received By			Date/Time		
FINAL SAMPLE DISPOSITION					Disposal Method e.g. Return to customer, per lab procedure, used in process.				
Disposed By					Date/Time				

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Duratek Federal Services		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 102222	
Collector K.J. - Gons		Contact/Requestor SYDOR, HAROLD				Page 1 of 1	
AF Number 502-046 (3832)		Sample Origin TX Farm				Tel. No. 372-9414 MSIN H0-22 FAX	
Project Title TX BOREHOLE (638507) 157		Logbook # DFNW-SAWS-HSS				Ice Chest # 2 Temp.	
Shipped To (Lab) AG + G		Method of Shipment Car Truck				Bill of Lading/Air Bill No.	
Protocol RCL A		Data Turnaround PER CONTRACT				Offsite Property No.	
Sample No.	Lab. ID	* Date	Time	No/Type Container	Sample Analysis	Preservative	
502046-11		5/16/02	0900	(1) Spoon	Per Contract		
502046-12		5/16/02	1317	(1) Spoon	Per Contract		
				( )			
				( )			
				( )			
				( )			
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				( )			
				( )			
				( )			
POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.							
MSDS Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> SPECIAL INSTRUCTIONS							
Hold Time							
Relinquished By K.J. Young	Print	Sign	Date/Time 5/16/02 1445	Received By Gunny Delore	Print	Sign	Date/Time 5/16/02 1445
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Matrix *							
S = Soil				DS = Drum Solids			
SE = Sediment				DL = Drum Liquids			
SO = Solid				T = Tissue			
SL = Sludge				W1 = Wipe			
W = Water				L = Liquid			
O = Oil				V = Vegetation			
A = Air				X = Other			
FINAL SAMPLE DISPOSITION							
Disposal Method e.g. Return to customer, per lab procedure, used in process.							
Disposed By							
Date/Time							

DFNW-SS-010



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Duratek FOURBI SERVICES		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# 102224	
Collector		Contact/Requestor	Sample Origin	Logbook #	Method of Shipment	Offsite Property No.	Preservative
SAF Number	502-046	C3832	TX-Farm	DFSNN-SAWS-HSS	Gov Truck		
Project Title	TX BOREHOLE (C3830) 1ST						
Shipped To (Lab)	AG + G						
Protocol	RCRA						
Sample No.	Lab. ID	Date	Time	No/Type Container	Sample Analysis		
502046-14	1	8/10/10	1000	(1) Spoon	Per Contract		
502046-15		8/10/10	1310	(1) Spoon	"		
				( )			
				( )			
				( )			
				( )			
				( )			
				( )			
				( )			
				( )			
				( )			
				( )			
POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.		MSDS		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	SPECIAL INSTRUCTIONS		
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time
Relinquished By	K.J. - [Signature]		8/10/10	Conny Leber		8/10/10	8/10/10
Relinquished By				Received By			
Relinquished By				Received By			
Relinquished By				Received By			
FINAL SAMPLE DISPOSITION		Disposal Method e.g. Return to customer, per lab procedure, used in process.		Disposed By		Date/Time	
						DFNW-SS-010	

[illegible]

Duratek Food Safety Services		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# 102226	
Collector	K.I. - founs	Contact/Requestor	SYDOR, HAROLD		Tcd. No.	372-9414	MSLN
SAF Number	502-046	Sample Origin	TX Farm		Purchase Order/Charge Code	40-22 FAX	
Project Title	TX Borehole (C3830)	Logbook #	DFS NW-SAWS-HSS		Ice Chest #	Dum #2 Temp.	
Shipped To (Lab)	AG + G	Method of Shipment	Gov Truck		Bill of Lading/Air Bill No.		
Protocol	RCRA	Data Turnaround	Per Contract		Offsite Property No.		
Sample No.	Lab. ID	No/Type Container	Sample Analysis		Perservative		
502046-17		5/18/02 1015	(1) Spoon		Per Contract		
502046-18		5/18/02 1520	(1) Spoon		"		
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
			( )				
POSSIBLE SAMPLE HAZARDS/REMARKS		MSDS	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
List all known wastes.		SPECIAL INSTRUCTIONS		Hold Time			
Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time	Matrix *
K.I. - founs	5/18/02	5/18/02 1020	Cherry	5/20/02	5/20/02 1020		S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Date/Time	Date/Time	Received By	Date/Time	Date/Time		
Relinquished By	Date/Time	Date/Time	Received By	Date/Time	Date/Time		
FINAL SAMPLE DISPOSITION		Disposal Method e.g. Return to customer, per lab procedure, used in process.		Disposed By		Date/Time	
						DFNW-SS-010	

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**APPENDIX E**  
**FIELD DOCUMENTATION**



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## Blow Count Form

Page 1 of 12

Date: 5/2-3/02 Operator: BSE  
 Location: TX Tank Farm Personnel: 1217  
 Borehole No.: C383Z Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 0.0 FT - 15.09  
 Drive casing size/type: 4.5" Total Depth: 15.09 FT bgs  
 Tip: 7.5" x 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PIPE

5/02/02

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
0 To 1.0	6		12:15	1
1.0 To 2.0	7			
2.0 To 3.0	7			
3.0 To 4.0	8			
4.0 To 5.0	8			
5.0 To 5.69	7			
5.69 To 6.69	11			
6.69 To 7.69	9			
7.69 To 8.69	10	N/A	N/A	N/A
8.69 To 9.69	10		1	
9.69 To 11.09	<del>11.09</del>		10:21	
11.09 To 12.09	13		11:13	
12.09 To 13.09	14			
13.09 To 14.09	15			
14.09 To 15.09	14			15.09

5/03/02

Prepared by: K. ReynoldsReviewed by: D. Skoglie

## Blow Count Form

Page 2 of 12

Date: 5/3-8/02 Operator: BSE  
 Location: TX Tank Farm Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 15.09 - 28.63  
 Drive casing size/type: 4.5" Total Depth: 28.63 FT bgs  
 Tip: 7.5" x 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PILE

5/03/02

5/06/02

5/07/02

5/08/02

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
15.09 To 16.21	12		11:15	15.09
15.0 To 16.0	13 (Redrive)			
16.0 To 17.0	14			
17.0 To 18.0	13			
18.0 To 19.0	13			
19.0 To 20.68	12		10:16	
20.68 To 21.68	10		10:46	
21.68 To 22.68	9			
22.68 To 23.68	12			
23.68 To 24.68	14	N/A	N/A	N/A
24.68 To 25.68	6			
25.68 To 26.02	15		10:47	
26.02 To 27.02	15		10:49	
27.02 To 28.02	15		10:50	
27.63 To 28.63	Redrive			28.63
Prepared by: <u>K. Reynolds</u>		Reviewed by: <u>D. Skofie</u>		

## Blow Count Form

Page 3 of 12

Date: 5/8/02 Operator: BSE  
 Location: TK TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 28.63 - 42.0  
 Drive casing size/type: 4.5" Total Depth: 42 FT bgs  
 Tip: 7.5" K 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PINSPILE

;108102

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
28.63 To 29.03	N/A			28.63
29.03 To 29.59	9			
29.59 To 30.59	10		7:56	
30.59 To 31.09	3		8:31	
31.09 To 32.09	8			
32.09 To 33.09	6			
33.09 To 34.09	6			
34.09 To 35.09	7			
35.09 To 36.09	6		8:32	
36.09 To 37.0	14		11:33	
37.0 To 38.0	12			
38.0 To 39.0	13	N/A	N/A	N/A
39.0 To 40.0	13			
40.0 To 41.0	13		11:35	
41.0 To 42.0	10			42.0

Prepared by: K. ReynoldsReviewed by: D. Skoglie

## Blow Count Form

Page 4 of 12

Date: 5/08-9/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S

Starter casing size: 7" Starter casing depth: 42.0 - 51.18  
 Drive casing size/type: 4.5" Total Depth: 51.18 FT bgs  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2" PIN PILE

	Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
5/08/02	42.0 To 43.0	8			42.0
	43.0 To 44.14	9			
109/02 Sample 502046-5	44.14 To 45.14	6			
	45.14 To 45.54	4			
	44.14 To 45.14	Redrive		10:36	
	45.14 To 45.95	18		10:37	
	45.95 To 47.18	31			
	47.18 To 48.18	32			
	48.18 To 49.18	30			
	49.18 To 50.18	29			
	50.18 To 51.18	27			
Sample 502046-6	51.18 To 51.68	3	N/A	N/A	N/A
	51.68 To 52.18	3			
	52.18 To 52.58	2			
	N/A To				

Prepared by: D. SkoglieReviewed by: [Signature]

## Blow Count Form

Page 5 of 12

Date: 05/13-102 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S

Starter casing size: 7" Starter casing depth: 51.18 - 60.12  
 Drive casing size/type: 4.5" Total Depth: 60.12 FT bgs  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PINPILE

Ample  
12046-07

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
51.18 To 51.93	10		08:40	51.18
51.93 To 53.08	19		08:41	
53.08 To 53.68	3 ( <sup>2</sup> <sub>in</sub> )		10:06	
53.68 To 54.28	2			
54.28 To 54.43	2		10:07	
53.08 To 53.87	5			
53.87 To 54.87	16			
54.87 To 55.87	22			
55.87 To 56.87	24			
56.87 To 57.87	29	N/A	N/A	N/A
57.87 To 58.87	32			
58.87 To 59.87	30			
59.87 To 60.12	8			60.12
To N/A To				

Prepared by: D. SKOGLIEReviewed by: [Signature]

## Blow Count Form

Page 6 of 12

Date: 05/13-14/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 60.12 - 69.01  
 Drive casing size/type: 4.5" Total Depth: 69.01 FT bgs  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PILE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
Ample 2046-08 { 60.12 To 60.72	3 (1 day)		07:40	
60.72 To 61.32	3		1	
61.32 To 61.52	2		07:41	
60.12 To 61.76				
Ample 2046-09 { 61.76 To 62.26	3			
62.26 To 62.76	2			
62.76 To 63.36	3			
61.76 To 62.76	15			
62.76 To 63.76	19			
63.76 To 64.76	26	N/A	N/A	N/A
64.76 To 65.86	31			
65.86 To 66.86	33			
66.86 To 67.86	41			
67.86 To 68.86	38			
68.86 To 69.01	6		14:54	69.01

Prepared by: D. SKOGLIEReviewed by: [Signature]

## Blow Count Form

PAGE 7 OF 12

Date: 5/15-16/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 69.01 - 78.99  
 Drive casing size/type: 4.5" Total Depth: 78.99 FT 695  
 Tip: 7.5" x 17.34" Conical: 4.75 I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PILE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
Sample 2046-10 { 69.01 To 69.51	3 (2 dry)		07:53	
69.51 To 70.01	2			
70.01 To 70.31	1		07:55	
69.01 To 70.95	22			
70.95 To 71.95	24			
71.95 To 72.95	34			
72.95 To 73.95	34			
73.95 To 74.95	34			
74.95 To 75.99	35	N/A	N/A	N/A
Sample 2046-11 { 75.99 To 76.59	3 (dry)		12:40	
76.59 To 77.09	2			
77.09 To 77.39	1		12:41	
75.99 To 76.99	13			
76.99 To 77.99	25			
77.99 To 78.99	28			

Prepared by: D. SkoglieReviewed by: [Signature]



## Blow Count Form

PAGE 8 of 12

Date: 5/16-17/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 78.99 - 86.99  
 Drive casing size/type: 4.5" Total Depth: 86.99 FT bgs  
 Tip: 7.5" x 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PINPILE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
sample 12046-12 { 78.99 To 79.49	6 (dry)		12:40	
79.49 To 79.99	4			
79.99 To 80.31	2		12:41	
78.99 To 79.99	14			
79.99 To 80.99	13			
80.99 To 81.99	26			
81.99 To 82.99	27			
sample 12046-13 { 82.99 To 83.49	2		11:12	
83.49 To 83.99	2			
83.99 To 84.34	1		11:13	
82.99 To 83.99	14			
83.99 To 84.99	19	N/A	N/A	N/A
84.99 To 85.99	19			
85.99 To 86.99	25		14:02	
To				

Prepared by: D. SkoglieReviewed by: Kurt Rebel

Page 9 of 12

**Blow Count Form**

Date: 05/20-21/02 Operator: BSE  
 Location: TK TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S

Starter casing size: 7" Starter casing depth: 86.99 - 95.64  
 Drive casing size/type: 4.5" Total Depth: 95.64 FT 595  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 ANGLE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
86.99 To 87.49	2 (dry)		09:15	86.99
87.49 To 87.99	5			
87.99 To 88.41	2		09:18	
86.99 To 87.99	11			
87.99 To 88.99	12			
88.99 To 89.99	17			
89.99 To 90.99	23			
90.99 To 91.99	15	N/A	N/A	N/A
91.99 To 92.99	26		1	
92.99 To 93.49	3 (dry)		14:29	
93.49 To 93.99	3			
93.99 To 94.4	3		14:30	
92.99 To 93.99	17			
93.99 To 94.99	20			
94.99 To 95.64	20			95.64

Prepared by: D. Skoglie Reviewed by: [Signature]

## Blow Count Form

Page 10 of

Date: 5/23-28/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 95.64 - 104.94  
 Drive casing size/type: 4.5" Total Depth: 104.94 FT bgs  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN ALE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
Sample 2046-16 { 95.64 To 96.14	5 (dry)		11:05	95.64
96.14 To 96.64	5			
96.64 To 97.04	2		11:08	
95.64 To 96.54	17			
96.54 To 97.54	28			
97.54 To 98.54	33			
98.54 To 99.54	31			
99.54 To 100.54	16			
100.54 To 101.54	27	N/A	N/A	N/A
101.54 To 102.54	29			
102.54 To 103.94	28			
Sample 2046-17 { 103.94 To 104.44	3 (dry)			
104.44 To 104.94	3			
104.94 To 105.36	2			
103.94 To 104.94	16		11:44	104.94
Prepared by: <u>D. Skoglie</u>		Reviewed by: <u>Kent Skoglie</u>		

## Blow Count Form

PAGE 11 OF 12

Date: 5/28-30/02 Operator: BSE  
 Location: TX TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 104.94 - 113.77  
 Drive casing size/type: 4.5" Total Depth: 113.77 FT 595  
 Tip: 7.5" X 17.34" Conical: 4.75" I.D.  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PILE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
104.94 To 105.94	18			104.94
105.94 To 106.94	25			
106.94 To 107.94	31			
107.94 To 108.94	32			
108.94 To 109.91	33			
sample 02046-18 { 109.91 To 110.41	5		14:31	
110.41 To 110.91	4		11	
110.91 To 111.38	3		14:33	
109.91 To 110.96	20			
110.96 To 111.96	22	N/A	N/A	N/A
111.96 To 112.96	50			
112.96 To 113.77	147		08:56	
sample 02046-19 { 113.77 To 114.27	13		11:03	
114.27 To 114.77	21		11	
114.77 To 115.2	36 <sup>half</sup> <sub>throttle</sub>		11:10	113.77
Prepared by: <u>D. Skoglie</u>		Reviewed by: <u>Kurt Sykes</u>		

## Blow Count Form

PAGE 12 OF 12

Date: 5/30-31/02 6/03/02 Operator: BSE  
 Location: TK TANK FARM Personnel: 1217  
 Borehole No.: C3832 Rig: 106 Hammer: ICE 40S  
 Starter casing size: 7" Starter casing depth: 113.77 - 114.24  
 Drive casing size/type: 4.5" Total Depth: 114.24 FT bgs  
 Tip: 7.5" x 17.34" Conical: 4.75" I.D  
 Joints: Welded: N/A Threaded: 4 1/2 PIN PILE

Depth	Blows/Ft.	Ave. Stroke	Driving time	Tip depth
113.77 To 114.0	60			113.77
114.0 To 114.24	102		09:12	
To	TAG bottom hole @		114.47	
114.47 To 114.97	6			
114.97 To 115.47	11			
115.47 To 115.89	20			114.24
To				
To	TOTAL DEPTH 115.89 FT bgs.			
To				
To				
To				
To				
N/A	N/A	N/A	N/A	N/A
To				
To				
To				

sample  
02046-20

Prepared by: D. SkoglieReviewed by: [Signature]

<div style="display: flex; justify-content: space-between;"> <span>DRIVE</span> <span>Duratek Federal Services, Inc., Northwest Operations</span> </div>							
TUBULAR GOODS DUAL STRING TALLY SHEET <span style="float: right;">Page 2 of 3</span>							
DATE: 06/03/02		WELL NUMBER: C3832		CONTINUATION OF REPORT NUMBER: 23			
CASING		INNER STRING		CASING		INNER STRING	
JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)
1A	1.45 (Shoe)	1B	0.82 (Tip)	19A	4.99 65.36	19B	2.0
2A	1.99	2B	4.99 (C)	20A	2.0 OFF	20B	5.0 71.1
3A	2.0	3B	5.25	21A	5.0 70.36	21B	3.0 OFF
4A	4.98 (10.42)	4B	5.01 (C)	22A	3.0 OFF	22B	5.01 (C) 76.11
5A	5.0	5B	5.0	23A	4.99 75.35	23B	5.0 81.11
6A	4.99	6B	5.02 (C)	24A	4.99 80.34	24B	3.0 OFF
7A	4.98	7B	5.0	25A	3.0 OFF	25B	5.01 (C) 86.12
8A	5.0 (30.39)	8B	2.0 OFF	26A	5.0 85.34	26B	2.0 OFF
9A	2.0 OFF	9B	5.01 (C) 36.10	27A	2.0 OFF	27B	4.0 OFF
10A	5.0 35.39	10B	5.0 41.10	28A	4.0 OFF	28B	5.0 91.12
11A	5.0 40.39	11B	5.01 (C) 46.11	29A	5.0 90.34	29B	5.01 (C) 96.13
12A	5.0 45.39	12B	3.01 OFF	30A	5.0 95.34	30B	2.0 OFF
13A	3.0 OFF	13B	5.0 51.11	31A	2.0 OFF	31B	5.01 101.14
14A	5.0 50.39	14B	4.99 (C) 56.10	32A	5.0 100.34	32B	5.01 (C) 106.15
15A	4.99 55.38	15B	2.0 OFF	33A	5.0 105.34	33B	3.0 OFF
16A	2.0 OFF	16B	5.0 61.1	34A	3.0 OFF	34B	5.0 111.15
17A	4.99 60.37	17B	4.0 OFF	35A	5.0 110.34	35B	4.0 OFF
18A	4.0 OFF	18B	5.0 (C) 66.1	36A	4.0 OFF	36B	5.01 116.16
TOTAL for Page:		6 FT		TOTAL for Page:		11 FT	
TOTAL for Page:		N/A FT		TOTAL for Page:		N/A FT	
TOTAL (ALL):		FT		TOTAL (ALL):		FT	
REPORT BY: DE Skogle				REVIEWED BY: MG Gardner			
TITLE: Field Team Lead DATE: 6/03/02				TITLE: Project Manager DATE: 8-13-02			
SIGNATURE: <i>David Skogle</i>				SIGNATURE: <i>MG Gardner</i>			

DRTK-WS-003

<b>DRIVE</b> <b>Duratek Federal Services, Inc., Northwest Operations</b>							
<b>TUBULAR GOODS DUAL STRING TALLY SHEET</b>						Page <b>3</b> of <b>3</b>	
DATE: <b>06/03/02</b>		WELL NUMBER: <b>C3832</b>		CONTINUATION OF REPORT NUMBER: <b>23</b>			

CASING		INNER STRING		CASING		INNER STRING	
JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)	JT. NO.	LENGTH (in feet)
<b>37A</b>	<b>5.0</b>	<b>37B</b>	<b>3.0</b>	<b>19A</b>		<b>19B</b>	
	<b>115.34</b>		<b>3.0 OFF</b>				
<b>38A</b>	<b>3.0</b>	<b>38B</b>	<b>5.0</b>	<b>20A</b>		<b>20B</b>	
	<b>3.0 OFF</b>		<b>OFF 121.16</b>				
<b>39A</b>	<b>5.0</b>	<b>39B</b>	<b>3.0</b>	<b>21A</b>		<b>21B</b>	
	<b>OFF 120.34</b>		<b>119.16</b>				
<b>40A</b>	<b>3.0</b>	<b>4B</b>		<b>22A</b>		<b>22B</b>	
	<b>118.34</b>						
<b>5A</b>		<b>5B</b>		<b>23A</b>		<b>23B</b>	
<b>6A</b>		<b>6B</b>		<b>24A</b>		<b>24B</b>	
<b>7A</b>		<b>7B</b>		<b>25A</b>		<b>25B</b>	
<b>8A</b>		<b>8B</b>		<b>26A</b>		<b>26B</b>	
<b>9A</b>		<b>9B</b>		<b>27A</b>		<b>27B</b>	
<b>10A</b>		<b>10B</b>		<b>28A</b>		<b>28B</b>	
<b>11A</b>		<b>11B</b>		<b>29A</b>		<b>29B</b>	
<b>12A</b>		<b>12B</b>		<b>30A</b>		<b>30B</b>	
<b>13A</b>		<b>13B</b>		<b>31A</b>		<b>31B</b>	
<b>14A</b>		<b>14B</b>		<b>32A</b>		<b>32B</b>	
<b>15A</b>		<b>15B</b>		<b>33A</b>		<b>33B</b>	
<b>16A</b>		<b>16B</b>		<b>34A</b>		<b>34B</b>	
<b>17A</b>		<b>17B</b>		<b>35A</b>		<b>35B</b>	
<b>18A</b>		<b>18B</b>		<b>36A</b>		<b>36B</b>	

TOTAL for Page: _____ FT TOTAL for Page: <b>N/A</b> FT TOTAL (ALL): _____ FT	TOTAL for Page: _____ FT TOTAL for Page: <b>N/A</b> FT TOTAL (ALL): _____ FT
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REPORT BY: <b>DE Skoglie</b> TITLE: <b>Field Team Lead</b> DATE: <b>6/03/02</b> SIGNATURE: <u><i>Paul Skoglie</i></u>	REVIEWED BY: <b>MG Gardner</b> TITLE: <b>Project Manager</b> DATE: <b>8-13-02</b> SIGNATURE: <u><i>M. Gardner</i></u>
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DRTK-WS-003

Table E-1. Blow Counts. (2 sheets total)

Depth	Blows	
0.00	0.00	
1.00	6.00	
2.00	7.00	
3.00	7.00	
4.00	8.00	
5.00	8.00	
5.69	7.00	
6.69	11.00	
7.69	9.00	
8.69	10.00	
9.69	10.00	
11.09	9.00	
12.09	13.00	
13.09	14.00	
14.09	15.00	
15.09	14.00	
16.21	12.00	
17.00	14.00	
18.00	13.00	
19.00	12.00	
20.68	12.00	
21.68	10.00	
22.68	9.00	
23.68	12.00	
24.68	14.00	
25.68	6.00	
26.02	15.00	
27.02	15.00	
28.02	15.00	
28.63	8.00	
29.03	10.00	
29.59	9.00	
30.59	10.00	
31.09	3.00	
32.09	8.00	
33.09	6.00	
34.09	6.00	
35.09	7.00	
36.09	6.00	
37.00	14.00	
38.00	12.00	
39.00	13.00	
40.00	13.00	
41.00	13.00	
42.00	10.00	
43.00	8.00	

Depth	Blows	
44.14	9.00	
45.95	18.00*	
47.18	31.00	
48.18	32.00	
49.18	30.00	
50.18	29.00	
51.18	27.00	
51.93	10.00*	
53.08	19.00	
53.87	5.00*	
54.87	16.00*	
55.87	22.00	
56.87	24.00	
57.87	29.00	
58.87	32.00	
59.87	30.00	
60.12	8.00*	
61.76		*
62.76	15.00	
63.76	19.00	
64.76	26.00	
65.86	31.00	
66.86	33.00	
67.86	41.00	
68.86	38.00	
69.01	6.00*	
70.95	22.00*	
71.95	24.00	
72.95	34.00	
73.95	34.00	
74.95	34.00	
75.99	35.00	
76.99	13.00*	
77.99	25.00*	
78.99	28.00	
79.99	14.00*	
80.99	13.00*	
81.99	26.00	
82.99	27.00	
83.99	14.00*	
84.99	19.00*	
85.99	19.00	
86.99	25.00	
87.99	11.00*	
88.99	12.00*	
89.99	17.00	



Depth	Blows	
90.99	23.00	
91.99	15.00	
92.99	26.00	
93.99	17.00*	
94.99	20.00	
95.64	20.00	
96.54	17.00*	
97.54	28.00*	
98.54	33.00	
99.54	31.00	
100.54	16.00	
101.54	27.00	
102.54	29.00	
103.94	28.00	
104.94	16.00*	
105.94	18.00*	
106.94	25.00	
107.94	31.00	
108.94	32.00	
109.91	33.00	
110.96	20.00*	
111.96	22.00*	
112.96	50.00	
113.77	147.00**	
114.00	60.00*	
114.24	102.00**	

\*Blow counts—advance rate affected by sampling point

\*\*Refusal

Depth	Blows	
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**APPENDIX F**  
**FIELD LOGBOOK ENTRIES**

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Project TX Borehole (C3830) 1507  
Continued from Page N/A (C3832)

Notebook No. DFSNW-SAWS-H55

5/2/02

- 0700 - On Site TX Farm attended prejob. K.J. Young Sampler  
(On hold waiting for package) F.M. Hall Sampler.  
1205 - Filled Equipment Blank # S02046-1 on the first  
Split Spoon used.  
1210 - Started driving pipe.  
1240 - On hold to reset drill rig.  
1410 - left site no split spoon sample pulled.

5/3/02

- 0705 - On Site TX Farm signed in on prejob K.J. Young Sampler  
F.M. Hall Sampler  
On hold waiting for drill to be reset.  
0900 - Started drilling -  
Drove casing to ft.  
1533 - collected sample # S02046-02 At 16.2 ft 100% recovery  
1545 - left TX Farm to ship samples. to 300 Area A6 & G

5/6/02

- 0705 - On Site, attended prejob & Safety Meeting K.J. Young  
1016 - Started driving pipe. (Sampler)  
1121 - Hydraulic line broke no sample today

5/7/02

- 0700 - On Site, signed prejob, waiting to fix Hydraulics.  
1051 - Started driving pipe. to reach 28-29 ft Sample point.  
1440 - Collected sample # S02046-03 At 28.09 ft 100% recovery  
1500 - left TX Farm to ship sample to 300 Area A6 & G

5/8/02

- 0707 - On Site, signed prejob.  
0832 - Started driving pipe to reach 37-38 ft Sample point.  
1045 - collected sample # S02046-04 At 37.89 ft 100% recovery  
1530 - left to ship to 300 Area A6 & G

5/9/02

- 0650 - On Site, signed prejob  
0840 - collected sample # S02046-05 At 45 ft

Continued on Page 26

Read and Understood By

K.J. Young  
Signed

5/9/02  
Date

Signed

Date

Project TX Borehole C3832  
Continued from Page 25

Notebook No. DFSNW-SAWS-H55

- 0900 - On hold Sample # 502046-05 showed free liquids  
waiting for the hole to recharge.  
0930 - No water in hole  
1006 - Started drilling to reach next sample depth. 52-53 ft  
1210 - On hold waiting for a hydraulic leak to be repaired.  
1230 - started drilling  
1515 - collected Sample # 502046-06 expect 100% recovery  
1532 - Left TX Farm to ship samples to 300 Area AG & G

5/13/02

- 0700 - On Site attended prejob. K.J. Young  
0750 - started driving casing to F.M. Hall  
reach next sample point 53-54 ft.  
1050 - collected sample # 502046-07 expect 100% sample  
Appears dark in color possibly moist  
1110 - started driving casing to reach 61-62 ft  
1445 - left sample at bottom to hole, high winds  
1510 - Left TX Farm to ship samples to 300 Area AG & G

5/14/02

- 0650 - On Site attended prejob - K.J. Young  
F.M. Hall  
0755 - started driving sampler at 61-62 ft # 502046-08  
0825 - collected sample # 502046-08 expect 100% recovery  
no moisture present.  
0900 - started driving casing to reach next sample point  
62-63 ft. 502046-09  
1340 - collected sample # 502046-09 expect 100% recovery  
no moisture present. no contamination  
1540 - Left TX Farm to ship samples to 300 Area AG & G

5/15/02

- 0705 - On Site attended prejob - K.J. Young (Sampler)  
0750 - started driving casing to reach next sample point 69-70 ft  
0922 - Sampler driven to 69-70 ft.  
1033 - collected sample 502046-10. expect 100% recovery  
no moisture, no contamination.

Continued on Page 27

Read and Understood By

*J. Young*  
Signed

5/13/02  
Date

Signed

Date

Project TX Bore Hole C3832  
Continued from Page 26

Notebook No. DFSNW-SAW-H53

27

1307 - started driving casing to reach next sample point of 76-77 ft

1510 - left TX Farm to ship sample to 300 Area 3720 building

05/16/02

0705 - Attended prejob / Safety meeting K.J. Young Sampler.

0900 - collected sample # S02046-11 expect 100% recovery  
no contamination, no moisture sample appears light in color

1003 - started driving casing to reach next sample point 79-80 ft.

1317 - sampled well # S02046-12 expect 100% recovery  
no contamination, no moisture sample appears light in color

1402 - Left TX Farm to collect sample equipment At 6290  
and then to ship to 3720 building, 300 area.

05/17/02

0650 - Attended prejob / Safety meeting At TX Farm - K.J. Young Sampler

1030 - started tripping into the hole to reach 83-84 ft sample point.

1153 - collected sample # S02046-13 expect 100% recovery  
50 counts above background possible contamination  
no free liquids sample light gray in color

1235 - Left TX Farm to ship sample to the 6290 bldg.

05/20/02

0710 - On Site Attended prejob At TX Farm K.J. Young - Sampler

0850 - started driving sampler

1000 - collected sample # S02046-14 expect 100% recovery  
no contamination, no moisture

1400 - started driving sampler

1510 - collected sample # S02046-15 expect 100% recovery

1530 - Left TX Farm to ship samples to the 6290 bldg.

05/21/02

0705 - On Site Attended prejob At TX Farm - K.J. Young Sampler

1040 - Drilling shut down due to high winds. F.M. Hall

Continued on Page

Read and Understood By

K.J. Young  
Signed

5/21/02  
Date

Signed

Date

Project TX - Borehole (C3832)  
Continued from Page 27

Notebook No. DFSNW-SAWS-H55

5/22/02 -

- 0800 On Site At TX Farm (Attended Security briefings At  
345 hills) Attended prejob K.J. Young Sampler.  
0940 - On hold due to high winds.  
1240 - Job shut down due to winds

5/23/02 -

- 0710 - On Site attended prejob / Safety meeting  
K.J. Young Sampler  
F.M. Hall Sampler  
0730 - On hold HPT has 3 hr of training.  
1105 - started driving sample to next sample depth  
of 96-97 ft.  
1145 - collected sample # S02046-16 expect sample  
to be 100% full. no signs of moisture or  
contamination.  
1250 - left to ship sample to 300 Area Lab.

5/28/02 -

- 650 - On Site Attended prejob / Safety meeting  
K.J. Young - Sampler  
F.M. Hall - Sampler  
0820 - started driving casing to reach next sample point  
of 104-105 ft Sample # S02046-17  
0931 - Drive sampler.  
1015 - collected sample # S02046-17 expect sample to  
be 100% full no moisture or contamination.  
1410 - Drive sampler to collect sample # S02046-18  
At 110-111 ft.  
1520 - collected sample # S02046-18 expect 100% collection  
no moisture or contamination.  
1600 - left TX Farm to ship samples to 3720 Lab.

5/29/02

- 0700 - On Site to Attend prejob K.J. Young - Sampler  
(on hold winds over 20 mph) F.M. Hall - Sampler

Continued on Page 29

Read and Understood By

K.J. Young *[Signature]*  
Signed

5/29/02  
Date

Signed

Date

Project TX-Borehole (C3832)  
Continued from Page 29

Notebook No. DFSMV-SAWS-HSS

1135 - No work today

5/30/02

0655 - On Site Attended project K.J. Young Sample  
F.M. Hall Sample

1102 - started to drive sample 114 to 115 ft.

1210 - collected sample # S02046-19, expect 100% recovery. sample dry and white in color  
sample drive hard.

1410 - Left Farm to ship sample to 3720 Lab.

5/31/02

0710 On Site TX Farm.

Attended project K.J. Young Sample.

F.M. Hall Sample

R.T. Sickle Sample (dock training)

0900 - On hold waiting for HPT

1110 - On hold waiting for PIC.

1310 - Closed up Farm, No sample collected today.

6/3/02

0717 - On Site TX Farm Attended project - K.J. Young Sample

0905 - started to drive sample # F.M. Hall Sample  
S02046-20, sample depth was 114-115 ft  
not 121-122 ft as planned in the TX Project  
Scope Summary, due to the fact that the  
advancement of the casing was so hard to  
drive.

1000 - collected sample # S02046-20, expect 100% recovery, sample moist, clean sands & rock.

1250 - Left TX Farm to ship sample to 3720 Lab.

1527

6/3/02

Continued on Page NONE

Read and Understood By

K.J. Young *[Signature]*

Signed

6/3/02

Date

Signed

Date



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**APPENDIX G**  
**EQUIPMENT CLEANING FORMS**

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6268 CLEANING FACILITY EQUIPMENT CHECK IN FORM			
QUANTITY	ITEM	CUSTOMER	PROJECT
21	Complete Split Spans	H. Sydnor	TX-104 (C3832)

**CUSTOMER INFORMATION:**

The equipment that is being submitted for cleaning, to the best of my knowledge, meets the following criteria for acceptance into the 6268 cleaning facility.

☒ Is new equipment that has never been utilized for field sampling.

☐ The equipment has been utilized for field sampling inside of a radiologically controlled area, but has been "free released" by field radiological control technicians.  
 If so, survey number: \_\_\_\_\_ RCT signature: \_\_\_\_\_ Date: \_\_\_\_\_

☐ The equipment has been utilized for field sampling, but was not utilized a radiologically controlled area.

Customer: \_\_\_\_\_ Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

**RECEIPT INFORMATION**

Receiver: K. J. Young Print Name: [Signature] Date: 4/16/02

6268 CLEANING FACILITY  
EQUIPMENT CHECK OUT FORM

QUANTITY	ITEM	CUSTOMER	PROJECT	TPCN or WORK ORDER
21	Complete Split Spans	H. Sydnor	C3832	116991 B516

\*All equipment has been cleaned per ES-SSPM-001 SP 2-5, "Laboratory Cleaning of RCRA/CERCLA Sampling Equipment.

Custodian Signature: *[Signature]* Print Name: K. J. Jones Date: 5/2/02  
Customer Signature: \_\_\_\_\_ Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

**APPENDIX H**

**WASHINGTON STATE DEPARTMENT OF ECOLOGY DOCUMENTATION**

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**Duratek Federal Services, Inc.**  
**Northwest Operations**

345 Hills Street  
Richland, Washington 99352  
(509) 376-7055 - Phone  
(509) 372-1435 - Fax

June 28, 2002

MGG-02-2225

Mr. Joe A. Caggiano  
State of Washington  
Department of Ecology  
1315 West 4<sup>th</sup> Avenue  
Kennewick, Washington 99336

Dear Mr. Caggiano:

**WATER WELL REPORT**

Attached is the Water Well Report for decommissioning well C3832. Well 3832 is located in the 200 West Area (TX Tank Farm).

Please reference Start Card Numbers S00630 (Notice of Intent to Construct a Geotechnical Soil Boring) and A30603 (Notice of Intent to Decommission a Well).

If you have any questions, please contact me at 372-8029.

Very truly yours,

A handwritten signature in black ink, appearing to read "Martin G. Gardner".

Martin G. Gardner, Manager  
Sampling and Well Services

jmt

**Attachment**

CHG	- A. J. Knepp	H0-22
	H. A. Sydnor	H0-22
CCI	- J. E. Auten	H9-03
DFSNW	- K. D. Reynolds	H1-11
	D. E. Skoglie	H1-11
	S. H. Worley	H1-11
	MGG File/LB	
	772028/506	



File Original with  
Department of Ecology  
Second Copy - Owner's Copy  
Third Copy - Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent A30603UNIQUE WELL I.D. # C3832Water Right Permit No. N/A(1) OWNER: Name U.S. Department of Energy Address 825 Jadwin, Richland, WA 99352(2) LOCATION OF WELL: County Benton NE 1/4 SW 1/4 Sec. 1 T. 12 N.R. 25E WM(2a) STREET ADDRESS OF WELL: (or nearest address) Hanford Site, 200 West Area, TX Tank FarmTAX PARCEL NO.: N/A(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal  
☐ Irrigation ☐ Test Well ☒ Other  
☐ DeWater(4) TYPE OF WORK: Owner's number of well (if more than one) N/A  
☒ New Well Method: ☐ Dug ☐ Bored  
☐ Deepened ☐ Cable ☒ Driven  
☐ Reconditioned ☐ Rotary ☐ Jetted  
☐ Decommission(5) DIMENSIONS: Diameter of well 7.5 inches  
Drilled 115.89 feet. Depth of completed well N/A ft.

## (6) CONSTRUCTION DETAILS

## Casing installed:

☐ Welded 7.0 ft. Diam. from 0 ft. to 114.24 ft.  
☐ Liner installed Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
☒ Threaded \_\_\_\_\_ ft. Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

## Perforations:

☐ Yes ☒ No

Type of perforator used \_\_\_\_\_

SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

## Screens:

☐ Yes ☒ No ☐ K-Pac Location \_\_\_\_\_

Manufacturer's Name \_\_\_\_\_

Type \_\_\_\_\_ Model No. \_\_\_\_\_

Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand \_\_\_\_\_

Material placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

## Surface seal:

☐ Yes ☒ No To what depth? \_\_\_\_\_ ft.

Material used in seal \_\_\_\_\_

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_

Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_

Type: \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.

Static level \_\_\_\_\_ ft. below top of well Date \_\_\_\_\_

Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_

Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? \_\_\_\_\_

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Yield: \_\_\_\_\_ gal./min. with N/A ft. drawdown after \_\_\_\_\_ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

Date of test \_\_\_\_\_

Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Airtest \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made? ☐ Yes ☐ No

ECY 050-1-20 (11/98)

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION  
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL FROM TO

Characterization

Boring As-Built Condition:

Sand/Gravel 0 113.00

Caliche 113.0 115.89

Total Depth 115.89

Back Pull Casing and fill 115.89 0

Borehole with Bentonite  
Crumbles.Work Started May 2, 2002 Completed June 13, 2002

## WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name D. E. Skoglie License No. 1580  
(Licensed Driller/Engineer)Trainee Name N/A License No. N/ADrilling Company Duratek Federal Services NW(Signed) David E. Skoglie License No. 1580  
(Licensed Driller/Engineer)Address 345 Hills Street, Richland, WA 99352

Contractor's

Registration No. DURATFS90K5Date June 28, 2002

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.



**Duratek Federal Services, Inc.**  
**Northwest Operations**  
345 Hills Street  
Richland, Washington 99352  
(509) 376-7055 - Phone  
(509) 372-1435 - Fax

March 20, 2002

MGG-02-2083

State of Washington  
Department of Ecology  
Water Resources Program  
Well Drilling Unit  
Post Office Box 47600  
Olympia, Washington 98504-7600

Dear Sir or Madam:

**NOTICE OF INTENT TO CONSTRUCT GEOTECHNICAL SOIL BORINGS**

Enclosed are three Notice of Intent to Construct a Geotechnical Soil Boring forms. These forms are completed with information pertaining to three geotechnical soil borings. The location of these geotechnical borings will be in the TX Tank Farm of the 200 West Area, Hanford Site, located at NE1/4 SW1/4 Section 1 Township 12N Range 25 E. The depth of the borings will be approximately 45.72 m (150 ft). The Hanford Well ID numbers assigned to these borings are C3830, C3831, and C3832.

Should you have any questions, or require additional information please contact me at (509) 372-8029.

Very truly yours,

A handwritten signature in dark ink, appearing to read "M. G. Gardner", is written over a horizontal line.

M. G. Gardner, Manager  
Well Services

jar

Enclosures (3)

CHG - H. A. Sydnor  
CHI - J. E. Auten  
DFSNW - D. E. Skoglie  
MGG File/LB



## Notice of Intent to Construct a GEOTECHNICAL SOIL BORING

S 00630

This form **must** be received by the Department of Ecology 72 hours prior to construction of soil boring. Complete this form and mail to Department of Ecology, Water Resources Program, Well Drilling Unit, P.O. Box 47600, Olympia, WA 98504-7600. Instructions for filling out this form are printed on the back.

1. Property Owner U.S. Department of Energy Phone No. (509) 373 9630  
Address (include city, state, zip) 825 Jadwin Ave., Richland, WA, 99352
2. Agent (if different from #1) DURATEK Federal Services NW Phone No. (509) 372 8029  
Address (include city, state, zip) 345 Hills ST, Richland, WA, 99352
3. Project Name TX VADOSE ZONE PROJECT, BORING # C3832
4. Well Location: NE 1/4 of the SW 1/4 Section 1 Township 12N Range 25 (EWM) (circle one)  
Address (if known) HAN FORD Site, 200 West Area, TX TANK WWM FARM
5. Location of Well(s)
 

<input type="checkbox"/> Adams County	01-ERO	<input type="checkbox"/> Grays Harbor County	14-SWR	<input type="checkbox"/> Pierce County	27-SWR
<input type="checkbox"/> Asotin County	02-ERO	<input type="checkbox"/> Island County	15-NWR	<input type="checkbox"/> San Juan County	28-NWR
<input checked="" type="checkbox"/> Benton County	03-CRO	<input type="checkbox"/> Jefferson County	16-SWR	<input type="checkbox"/> Skagit County	29-NWR
<input type="checkbox"/> Chelan County	04-CRO	<input type="checkbox"/> King County	17-NWR	<input type="checkbox"/> Skamania County	30-SWR
<input type="checkbox"/> Clallam County	05-SWR	<input type="checkbox"/> Kitsap County	18-NWR	<input type="checkbox"/> Snohomish County	31-NWR
<input type="checkbox"/> Clark County	06-SWR	<input type="checkbox"/> Kittitas County	19-CRO	<input type="checkbox"/> Spokane County	32-ERO
<input type="checkbox"/> Columbia County	07-ERO	<input type="checkbox"/> Klickitat County	20-CRO	<input type="checkbox"/> Stevens County	33-ERO
<input type="checkbox"/> Cowlitz County	08-SWR	<input type="checkbox"/> Lewis County	21-SWR	<input type="checkbox"/> Thurston County	34-SWR
<input type="checkbox"/> Douglas County	09-CRO	<input type="checkbox"/> Lincoln County	22-ERO	<input type="checkbox"/> Wahkiakum County	35-SWR
<input type="checkbox"/> Ferry County	10-ERO	<input type="checkbox"/> Mason County	23-SWR	<input type="checkbox"/> Walla Walla County	36-ERO
<input type="checkbox"/> Franklin County	11-ERO	<input type="checkbox"/> Okanogan County	24-CRO	<input type="checkbox"/> Whatcom County	37-NWR
<input type="checkbox"/> Garfield County	12-ERO	<input type="checkbox"/> Pacific County	25-SWR	<input type="checkbox"/> Whitman County	38-ERO
<input type="checkbox"/> Grant County	13-ERO	<input type="checkbox"/> Pend Oreille County	26-ERO	<input type="checkbox"/> Yakima County	39-CRO
6. Total number of borings to be constructed 1
7. Approx soil boring construction date MARCH 25, 2002
8. Well Drilling Co Name BLUE STAR ENTERPRISES Phone No (509) 946 9388
9. Well Driller's Name MR. Kelly Olson Driller's License No 1217
10. Contractor's L & I Registration No BLUES E I 980C 6
11. Please fill out the portion below carefully. The return address label must contain the name and address of the person submitting this notification. This portion will be validated and returned to them as proof of notification. Send the entire form to Department of Ecology, Water Resources Program, Well Drilling Unit, P.O. Box 47600, Olympia, WA 98504-7600.

This notification number **must** be provided to your well driller:

S 00630

Submit by (return address)

Name <u>MR. MARTIN G. GARDNER</u>	
Mailing Address <u>345 Hills ST.</u>	
City <u>Richland</u>	State <u>WA</u> Zip <u>99352</u>

Agency Validation
Date _____

ECY 040-55 (10/97)

**APPENDIX I**  
**HEALTH AND SAFETY MONITORING**

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**Duratek Federal Services, Inc.**  
**Northwest Operations**

345 Hills Street  
Richland, Washington 99352  
(509) 376-7055 - Phone  
(509) 372-1435 - Fax

May 15, 2002

MGG-02-2155

Mr. H. A. Sydnor  
CH2M HILL Hanford Group, Inc.  
Post Office Box 1500  
Richland, Washington 99352-1505

Dear Mr. Sydnor:

**SUBMITTAL OF RESULTS FROM TX DRILLING AND SAMPLING NOISE  
MONITORING**

Reference: Memo, J. G. Paetel, CHG, to T. D. Lippert, DFSNW, "Contract 8248, Release 55,  
Request for Proposal/Notice to Proceed," dated December 13, 2001.

Duratek Federal Services, Inc. Safety and Health conducted noise monitoring at the TX tank farm vadose drilling and sampling site on May 14, 2002. The purpose of the noise monitoring was to determine the noise levels generated during casing and sampler driving activities and to evaluate the hearing protection requirements as specified in the job specific Activity Hazard Analysis.

Mr. Kelly Olson, the Blue Star Enterprises driller, wore a Metrosonics Metrologger personal monitoring device for the duration of his work shift (approximately eight hours). Mr. Olson was selected for the monitoring since he works closest to the diesel hammer when it is operated and operates all drill rig controls. The results of the data show a Time Weighted Average (TWA) of 94.0 dB, well above the OSHA standard action level of 85 dB TWA. This data is consistent with previous noise monitoring conducted on the SX Slant Hole project where the same drilling method was deployed. A copy of the summary report of the data download from the monitoring device and a chart with the data plot is attached for your review.

Activities performed by Mr. Olson and the drill crew were routine and typical for casing driving and sampling tasks with no unique activities conducted in or around the drill location. Therefore, the noise sample collected is an accurate representation of expected daily noise exposure while working on the deck of the drill rig. The procedures for minimizing the noise exposure to workers will remain consistent with the requirements set forth in the current approved job specific Activity Hazard Analysis (AHA-02-002). Those requirements are double protection while the diesel hammer is in operation and single protection during the remainder of the drilling activities (within the current exclusion zone).

Mr. H. A. Sydnor  
Page 2  
May 15, 2002

MGG-02-2155

If you have any questions, or require additional information or documentation, please contact me at 372-8029. Thank you for the opportunity to be of service.

Very truly yours,



M. G. Gardner, Manager  
Sampling and Well Services

jmt

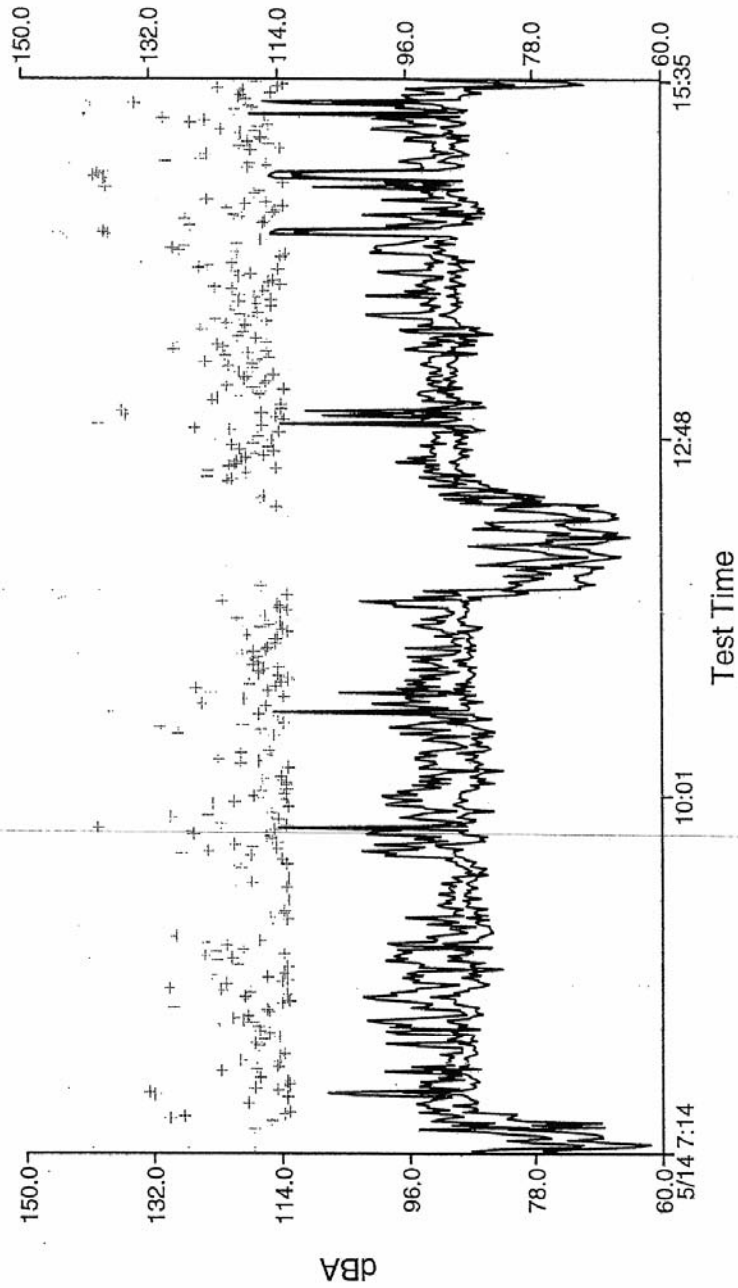
Attachment

CHG - A. J. Knepp  
P. K. Aardal

BSE - R. Dobush

DFSNW - D. J. Moak  
K. D. Reynolds  
D. E. Skoglie  
J. J. Sweesy  
R. L. Van Wormer  
MGG File/LB  
CHG/772028/506

# TX Tank Farm MAPR



OverAll Lav = 93.8dB

\* Over Range

+ Lpk

— Lmax

— Lav



## Summary Report

Test Location.....TX Tank Farm  
Employee Name....Kelly Olson  
Employee Number...0029732  
Department.....Blue Star Employee  
Comment.....performed normal borehole drilling activities. Good range of work duties.

Metrosonics db-3100 SN 5711 V1.7  
Report Printed 05/15/02 at 07:25  
Exchange Rate...3 dB  
Filter...A Wt.  
Dose Criterion....85 dB  
Response.....Slow

Calibrator Type.....Accustical SN..6114  
Calibrator and Calibration Date..12/20/01

Pre-Test Calibration Time: 05/14/02 at 06:30  
Pre-Test Calibration Range: 40.3dB to 140.3dB

Post Calibration 05/15/02 at 06:25

Test Began.....05/14/02 at 07:14  
Test Length....0 Days 08:22  
Test Ended...05/14/02 At 15:36

Lav.....93.8dB  
Lav (80)...93.8dB  
Lav (90)...93.1dB  
SEL.....138.5dB

---

TWA.....94.0dB  
TWA (80)..94.0dB  
TWA (90)..93.3dB

Lmax...117.8dB on 05/14/02 at 15:21  
Lpk.....141.0dB on 05/14/02 at 15:22

Time Over 115.0dB 0 Days 00:00:04

8 HR % Dose (80dB Cutoff).....804.09%  
8 HR % Dose (90dB Cutoff).....687.61%